THE IRON AGE

THURSDAY, JUNE 7, 1888.

New Toggle Drawing Press.

A new departure in the construction of double-action presses for drawing sheet metal has recently been made by the E. W. Bliss Company, of Brooklyn, N. Y., the engravings which we publish showing an example. The press belongs to a class of tools in which it is necessary for the slide or mandrel to descend and remain at rest during about one-third of a revolution of the shaft. This action has for years been accomplished by means of one or more cams on the crank-shaft, but the pressure with which it is necessary to hold the mandrel down is so great that even when the cams are made of cast steel, working upon cast-steel rolls and the latter running on hardened steel pins, there is great wear and cause for frequent repair. Toggles operated by cams, wedges worked in a similar manner, and, in fact, a great variety of devices have from time to time been made use of to overcome the difficulty, but whatever the mechanism it has invariably been operated directly or indirectly by a cam motion. The principal feature of the machine illustrated is that the pause or dwell of the mandrel is obtained by a unique arrangement of linkwork and without the use of any cam whatever. This action may be understood by referring to Figs. 2 and 3 on the next page. On the end of the shaft, outside the frame of the machine, is placed a crank which operates a slide or crosshead, A. Across the front and back of the machine are placed two rock-shafts B B, supplied with arms carrying links C C. These links are pivoted to yokes which operate the mandrel. On the opposite side of the rock-shafts are arms D D, connected by short links G G to the crosshead A. Fig. 1 shows the position when the mandrel is at the highest point of its stroke, and Fig. 2 when it comes to rest at the lowest point. It will be seen that while the pins E E in the crosshead are traveling from the position shown in Fig. 2 to the end of their stroke at F and back again the links G G lie nearly at right angles to the direction of motion, so that but a trifling motion is imparted to the rock-shafts B B during this time, and as the links C C lie in line with the centers of the rock-shafts no motion is given to the yokes. But to move the crosshead from the position shown to the end of its stroke and back again requires about one-third of a turn of the crank-shaft. As the crosshead passes this point the links G G are brought more and more in line with the direction of motion, thus rotating the rock-shafts B B, and thereby lifting the mandrel. The general dimensions of the press are: Stroke of plunger, 10 inches;

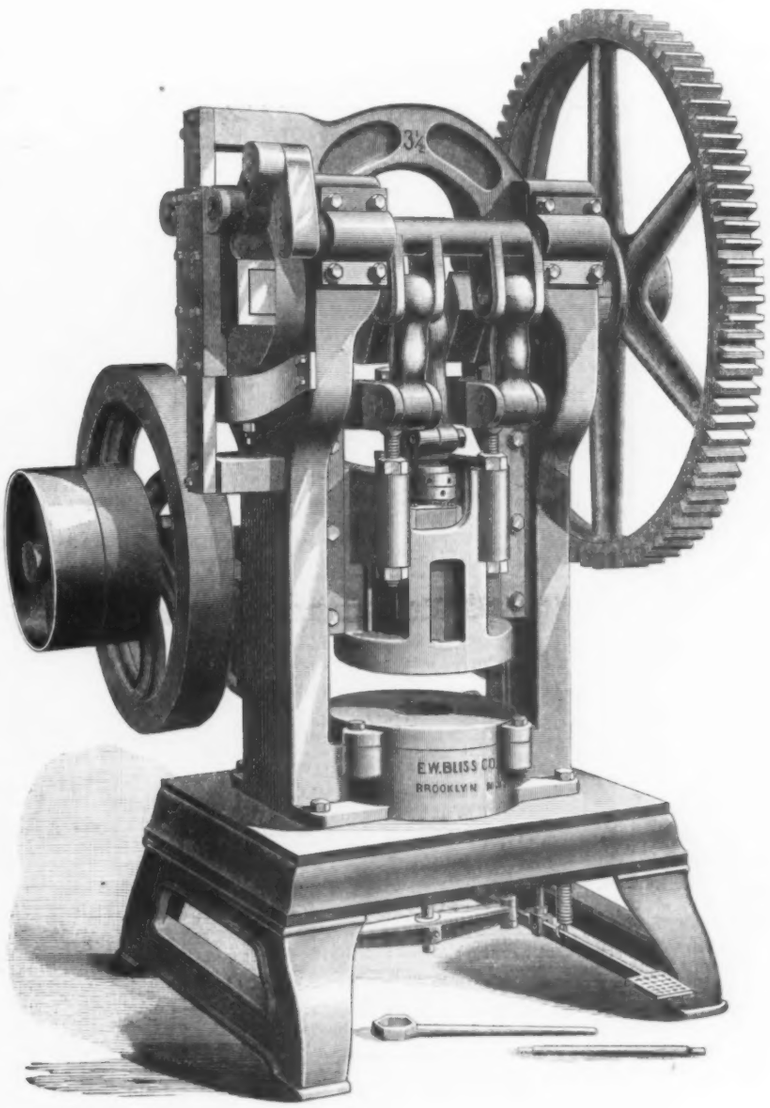


Fig. 1.—General View.

NEW TOGGLE DRAWING PRESS, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y.

stroke of blank-holder, 5 inches; greatest diameter of blank the press will take, 20 inches; diameter of drawing punch, 14 inches. The spur-gear is 60 inches in diameter by 6 inches width of face, and the gearing is 7½ to 1, the slide making about 26 strokes per minute. The weight complete is about 10,000 pounds.

Marine Boiler and Engine Weights per Horse-Power.

The steady decrease from year to year in the weight of marine engines and boilers, especially in war ships, is very strikingly shown in an article on "The Development of the Marine Engine in the British Navy," published recently in the London *Engineer*.

Beginning with the single engine in 1872 we find in a presumably representative case a weight of boilers of 186 pounds per indicated horse-power and a weight of engines of 179 pounds, or a total weight of 365 pounds per indicated horse-power. The steam pressure here was about 30 pounds and the speed 77 revolutions per minute. A fair example of the compounds with ordinary draft tried in 1884 shows a steam pressure of 90 pounds; revolutions, 100.2 per minute; weight of engines, 135 pounds per horse-power; weight of boilers, 185 pounds, or a total weight of 320 pounds per horse-power. The next class to be mentioned is that of compound engines with forced draft. The influence of this method of increasing the generation of steam has been very powerful indeed in reducing boiler weights, the weight of the fans and other fittings required for obtaining the air pressure being very small compared with the gain derived by reduction in the weight of the boilers themselves. Taking several vessels tried in 1885 we find that in the lightest of them the weight of boilers had diminished to from 103 pounds to 125 pounds per indicated horse-power developed. The adoption of the forced draft system, too, was simultaneous with a considerable increase in the number of revolutions of the engines, from 120 to 150 per minute being common for many engines of considerable power, and also an extended use of steel for framing and other parts which favored lightness, so that we find the engine weights also of this series to have been reduced very considerably, from 80 pounds to 100 pounds per indicated horse-power developed being the reduced weight of several of the engines. The average of the two lightest ships of the series is: Engines, 80 pounds; boilers, 110 pounds, or a total weight of 190 pounds per indicated horse-power developed.

The change of type of engine to triple expansion soon followed the adoption of forced draft, the working pressure being also immediately increased to 130 pounds, to 135 pounds, and latterly to 150 pounds, per square inch. The addition of another cylinder caused an increase of weight of engines, and the increase of pressure caused a smaller reduction, the net result being at first a slight increase of weight of engines compared with the preceding type. As regards the boiler weights, the increase of pressure tended to increase this part of the weight, but the economy of the triple expansion system and the use of a more powerful fan-blast more than counterbalanced this tendency to increase of weight, and on the whole there was a slight reduction of boiler weights in spite of the additional boiler pressure. The total weight of machinery was at first a trifle greater than the lightest of the compound engines, but this slight excess of weight has been recovered in the most successful of recent vessels. These show about 96 pounds for engines and 96 pounds for boilers, or a total weight of machinery of 192 pounds per indicated horse-power before. The lightest engines, not of the torpedo-boat type, now being constructed are of the twin-screw vertical triple expansion type of 9000 indicated horse-power, running at 140 revolutions per minute, and the machinery will weigh, engines 71 pounds, boilers 85 pounds, or a total weight of machinery of only 156 pounds per indicated horse-power. Coming to machinery of a special type, we have that of the torpedo boats of various classes in which, to save the weight, many methods of construction are adopted which are not admissible for sea-going vessels intended for ordinary sea-service. The lightest machinery of this kind weighs 23 pounds per indicated horse-power for engines and 38 pounds per indicated horse-power for boilers, or a total weight of machinery of only 61 pounds per indicated horse-power.

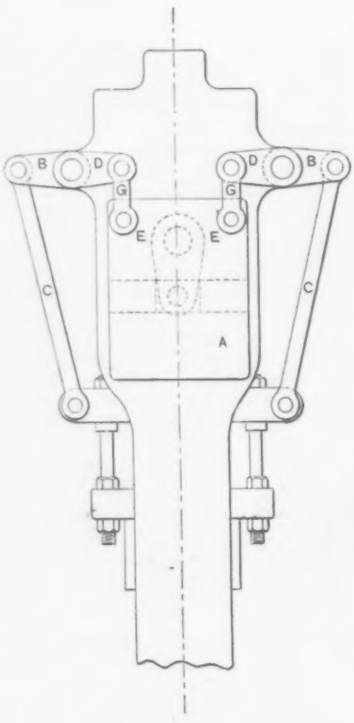


Fig. 2.—Position of Links at Limit of Up Stroke.

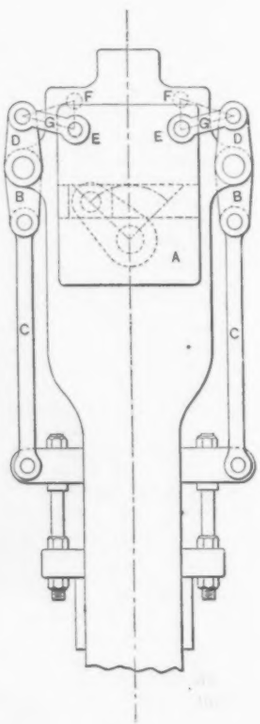


Fig. 3.—Links at End of Down Stroke.

DETAILS OF TOGGLE PRESS, BUILT BY THE E. W. BLISS COMPANY, BROOKLYN, N. Y.

California Marine Engines.

Under the above head the *Mining and Scientific Press*, of San Francisco, writes: Within the past three years the coasting trade has largely increased in California, especially that connected with the lumbering interests. Formerly all the lumber was transported on sailing schooners, but of late steam schooners have been employed. These vessels have masts and sails, and use the sails when the wind is fair, but they steam up the coast against the summer winds, which blow from the northwest. So while the schooners from the lumber ports have a fair wind down when loaded, they steam up when light, and a great deal of time is saved. The Fulton Iron Works, of this city, have built most of the engines for those steam schooners, having made a specialty of this class of work. They are made from 50 to 500-horse power in sizes, but of the same type. As a rule they are the ordinary engines, built compactly and light, and do not differ in arrangement from compound engines as built all over the world. The simplest and most efficient details have been adopted. For the lumber schooners engines are made from 150 to 300 horse-power; the larger ones for colliers, &c.

There are some eight or ten of these engines being made at the Fulton Works now, and recently we saw several of them set up and receiving the finishing touches. There are four of the ordinary compound on hand, all of 150 horse-power, and three are those of 200 horse-power. Several triple-compound engines have been and are being made—those for the Noyo, San Diego, Point Loma, and one other, are complete. The trial trip of the Point Loma was made lately, and was very satisfactory. One quadruple engine is now being fitted up for a coaster. A large triple engine is being built for a steam collier. This engine will have a high-pressure cylinder of 18 inches, intermediate of 30 inches, and low-pressure cylinder of 48½ inches, with 36-inch stroke. This is about a 600 horse-power engine. The steel plates for the boilers of triple engines are 1 inch thick, and those for the quadruple are 1¼ inches thick. The triple engines are made for 150 pounds pressure, and the quadruples to run with 175 pounds.

Altoona reports state that a syndicate of capitalists have closed the purchase of 10,000 acres of coal land, located in the Black Lick field, Cambria County, and will proceed to develop it at once. The price paid was $12 an acre, and this is the heaviest real estate sale in years. Iron ore and fire clay abound on the land. It is stated that 1500 coke ovens will be established within two miles of Ebensburg.

The Chemistry of Foundry Irons.

Standard Grades and Chemical Composition.

BY CARL A. MEISSNER, STERLING FURNACE, STERLINGTON, N. Y.

The following notes represent the result of three years' work on the chemistry of foundry irons by the writer while in the employ of a well-known furnace company, making a specialty of various grades of foundry irons.

No particular degree of originality is claimed for these investigations. The information, it is true, on the subject was at the start in 1882 of a very meager description. The great authorities on iron and steel had touched this part but lightly, devoting more space to steel and Bessemer irons, as being at that time of greater importance. It was not until about a year ago that I got hold of Professor Ledebur's works, which, had I had them in 1882, would have helped me out of many a perplexity. I can only say in regard to this author's works that they give about the most succinct and practical information on the subject of iron particularly that I have yet read. The style of his remarks is of such a directly practical nature, and taken from such directly practical sources, that I cannot refrain from adding my mite of admiration for this author. I refer the reader especially to his "Handbuch der Eisenhuettenkunde" and to his "Das Roheisen mit Besonderer Berueeksichtigung seiner Verwendung in der Eisengiesserei."

In all these notes I shall not quote much from any author, as it is not the intention to write a treatise, but merely to present the result of my personal investigations. When the Brier Hill Iron and Coal Company began in 1882 we barely knew how much phosphorus ought to be in foundry irons; a start in the right direction was at length made by obtaining some samples of Scotch iron, specially with a view to determine how little manganese was in the same, as this metal was considered a bugbear in those days, anything above 1 per cent. being sufficient to condemn the iron at once. It was therefore with surprise that the following results were obtained:

	Summerlee Grade 1.		Eglington. Grade 1.	Coltness. Grade 1.
Silicon	2.70	2.47	2.15	2.59
Phosphorus	0.545	0.760	0.618	0.845
Manganese	1.80	2.51	2.80	1.70
Sulphur	0.01	0.015	0.025	0.010
Graphite	3.00	....	3 76	....
Combined carbon	0 25	....	0.21	3.75

These figures naturally threw a new light on the subject, some more of the best known Scotch brands were obtained and carefully analyzed, grades noted, as also the purposes for which they were used, and on these figures were based the—to the trade—well known brands of above company.

The following are some more of the Scotch iron analyses, together with two copies gotten hold of at a later date:

	Carnbroe.	Glenarcen or Glengarnock.		Summerlee.	
	No. 1.	No. 1.	No. 2.	No. 1.	No. 2.
Silicon	1.70	3.03	4.00	3.44	2.70
Phosphorus	1.100	1.200	0.900	1.00	0 810
Manganese	1.83	2.85	3.40	1.70	2.90
Sulphur	0.008	....	0.01	0.015	0.02
Graphite	3.50	...	1.78	....	2.00
Combined carbon	0.40 (Copy)	....	0.90 Was said to carry ⅔ scrap.	....	0.80 (Copy)

All these figures, then, were the basis of the various brands of the company that enabled them to successfully stand the hard years of 1883 to 1885 without putting any of their furnaces out of blast.

A long series of analyses was then undertaken of the brands of competitors where successful and from these an iron made as nearly alike the one desired to compete with as practicable, and with almost invariably satisfactory results, proving the value of the work in hand. These analyses are of samples from almost every part of the United States and include most of the prominent iron firms, proving of great value to the company, as it was merely necessary to look up the analysis book whenever our agents named a certain brand as being a strong competitor.

I shall give a few of the more important analyses where the samples were accompanied by a clear description of the physical properties, omitting of course the names of the firms from whose furnaces they came, as I hardly feel at liberty to promiscuously publish analyses of such a character without consent of the makers.

Of course it was quickly found that the partial analyses thus made were not in themselves sufficient, as the physical conditions or grades had to receive their full share of attention. We frequently found irons to have the same composition so far as silicon, manganese, phosphorus and sulphur were concerned, but the "grade" or graphite formation was so different as to make them work like two different irons. Some hundred or more analyses could be given of irons from various firms, but they would only be a repetition of some of those herein stated, which latter have been carefully selected with a view to fully cover the ground gone over at the time. More graphite and combined carbon determinations were not made mainly for lack of time, but also because it was obvious that the "grade" gave a sufficient indication of the amount of graphite present. An open iron was sure to have a high percentage of graphite and a close one a low percentage of graphite and *vice versâ*. I shall begin with irons used for machine purposes:

Sample No.	Silicon.	Phosphorus.	Manganese.	Sulphur.	Graphite.	Com. carbon.	Grade No.
1	2.80	0 492	0.61	0.015	.....	.....	1
2	1.80	0.262	0.70	0.080	.....	.....	3
3*a*	2.66	0.770	1.20	0.020	2.51	.....	2
3*b*	3.63	0.411	1.25	0.014	3.05	.. ..	1
4	2.10	0.415	0.60	0.050	....	.....	2
5	1.37	0.294	1.51	0.080	2.31	0.78	2
6	3.10	0.124	trace	0.021	.....	.....	2
7	2.12	0 610	0.80	.....	.....	.....	...
8	1.70	0.632	1.60	.....	.....	.....	..
9*a*	1.45	0.470	1.25	0.009	.....	.....	2
9*b*	1.40	0.316	1.37	0.008	.....	.....	....
10	3.26	0.426	1.25	.....	.....	.....	1
11	0.80	0.164	0.90	0.015	.....	.....	1

Description of Samples.

No. 1.....A famous Southern brand noted for fine machine castings.

No. 2.....Also a Southern brand, a very good machine iron.

No. 3*a* and No. 3*b*.....Formerly one of the best known Ohio brands. Does not shrink; is very fluid and strong. Foundries having used this have reported very favorably on it.

No. 4.....Iron from Brier Hill Co. made to imitate No. 3; was stronger than No. 3; did not pull castings; was fluid and soft.

No. 5.....Copy of a very strong English machine iron.

No. 6.....A Pennsylvania iron, very tough and soft. This is partially Bessemer iron, which accounts for strength, while high silicon makes it soft.

No. 7.....Castings made from Brier Hill Co.'s machine brand for scale works, very satisfactory, strong, soft and fluid.

No. 8.....Castings made from Brier Hill Co.'s one-half machine brand, one-half Scotch brand, for scale works, castings desired to be of fair strength, but very fluid and soft.

No. 9*a*.....Brier Hill machine brand made to compete with No. 3.

No. 9*b*.....Castings (clothes hooks) from same, said to have worked badly, castings being white and irregular. Analysis proves that some other iron too high in manganese had been used, and probably not well mixed.

No. 10.....A Pennsylvania iron, excellent machine iron, no shrinkage, soft and strong.

No. 11.....A very good quality northern charcoal iron.

Next in order are the American Scotch irons, or irons made especially to compete with Scotch irons. There is here a wider range of analysis, as different purposes will take different percentages; also the amount of scrap desired to be used influences the choice from analysis.

No. Sample.	Silicon	Phosphorus.	Manganese.	Sulphur.	No. Grade	
12	6.00	0.430	1.00	.....	1	.....
13	1.67	1.920	1.90	... ..	... ..	casting
14	2.40	1.000	1.70	.....	2	....
15	1.28	0.690	1.40	.....	2	.....
16*a*	3.50	0.613	2.51	.....	1	.....
16*b*	2.90	0.733	1.40	.....	.....	casting
17*a*	3.44	1.000	1.70	0.015	1	.....
17*b*	3.35	1.300	1.50	0.012	1	.....
18	3.68	0.503	2 96	.. ..	1	.....

No. 12.....A well-known Ohio-Scotch iron is almost silvery, but will carry two-thirds scrap made in part from Blackband ore. A very successful brand, hard to compete with. The very high silicon gives it its large scrap-carrying capacity.

No. 13.....Brier Hill Scotch castings made for scale works, castings demanding more fluidity than strength. Is very satisfactory.

No. 14.....Formerly a famous Ohio-Scotch brand, not made any more now. Was almost the first American iron to successfully compete with Scotch iron. Made mainly from Blackband ore.

No. 15.....A good Ohio-Scotch, very soft and fluid, made in part from Blackband ore.

No. 16*a* and No. 16*b*.....Brier Hill Scotch iron and casting, made for stove purposes; 350 pounds of iron used to 150 pounds of scrap gave very soft fluid iron, worked well.

No. 17*a* and No. 17*b*.....Shows comparison between Summerlee (Scotch) 17*a* and Brier Hill Co.'s Scotch 17*b*. Drillings were sent by a Cleveland foundry, who found both irons closely alike in physical and working quality.

No. 18.....One of the most famous Southern irons, very hard to compete with, owing to its general qualities and great regularity of grade and general working.

We will now take up the silvery irons.

Sample No.	Silicon.	Phosphorus.	Manganese.	Silicon.	Grade No.	
19	2.65	0.740	1.70	0.020	3	.....
20*a*	4.00	0.521	1.40	.....	1	.....
20*b*	3.63	0.525	1.00	.....	... ..	casting.
21	3.80	0 880	1.20	.....	1	... .
22*a*	5.00	1 260	1.50	.....	2	.....
22*b*	1.75	0.503	1.20	.....	2	.....
23	6.30	1.000	1.62	0.022	1	....
24*a*	1.80	1.400	2.20	0.015	3	.....
24*b*	0.20	0.090	0.92	0.020	... ..	.....
25*a*	6.00	0.923	2.34	0.020	1	.....
25*b*	5.56	1.755	1.50	0.022	1	.....
26*a*	2.30	1.360	2.40	0.013	1	.....
26*b*	6.86	1.218	2.34	0.021	1	.....
26*c*	1.30	0.262	0.70	0.030	3	....
26*d*	2.65	0.907	1.25	0.080	....	casting.
26*e*	1.72	0.975	1.30	0.027	.....	casting.
27	3.92	0.658	1.12	.....	3	.....
28	6.42	1.890	1.65	.....	1	... .

No. 19....Pennsylvania iron used as a softener, will carry one-half scrap. Made from native carbonate ores.

No. 20....Pennsylvania iron. Very fluid and soft, will make very thin castings.

No. 21....New York iron. Very cheap, fluid iron, will carry two-thirds scrap, although hard to say why it should.

No. 22*a*. and No. 22*b*. Used as a softener with excellent results in a mixture of one-half with one-half our company's machine iron 22*b*.

No. 23....Kentucky iron, very soft, competes directly with Scotch iron along the Eastern coast.

No. 24*a*. and No. 24*b*. Silvery iron, which made some excellent muck bar, of which 24*b* is analysis.

No. 25*a*. and No. 25*b*. A very well-known Jackson County iron, famed for softness and scrap-carrying capacity.

No. 26....Drillings and castings sent from large stove company; castings were thin—were bad, brittle, weak and irregular, although soft where gray. One was nearly white; the other had white streak between two gray edges. General formation and appearance of castings would indicate that the various irons had not mixed well. I should also say that those castings, considering their thinness, contained too much manganese, which, together with irregular mixing, caused bad work.

No. 26*a*...Brier Hill silvery
No. 26*b*...Jackson County silvery.
No. 26*c*...Southern machine iron.
} Mixture of pig irons used.

No. 26*d*...White casting.

No. 26*e*...Gray casting with white streak in center.

No. 27....Ohio silvery, very good for floor plates and other similar work. Carries heavy amounts of scrap.

No. 28....Jackson County iron. Very soft and fluid.

Of mill irons I shall only give two analyses, as they do not rightly belong in this paper:

No. 29.		No. 30.	
Si	0.70	Si	0.87
P	1.10	P	0.96
Mn	0.30	Mn	2.00
S	0.042	S	0.05

No. 29 was anthracite iron, all magnetite ore; very satisfactory. No. 30 was coke iron, all soft ores; very good.

I will now append a number of analyses of various castings which may prove of interest:

Sample. No.	Silicon.	Phosphorus	Manganese.	Sulphur.	Graphite.	Com. carbon.
31	2.50	1.400	2.20	.....	.....	....
32	0.85	0.351	0.92	0.030	.....	....
33	1.53	0.327	1.08	0.040	3.10	0.58
34*a*	1.84	0.577	1.04	.....	.....	....
34*b*	2.20	0.742	1.10	.....	.....	....
34*c*	2.50	1.208	1.16	.....	.....	....
35*a*	2.80	0.418	0.54	.....	.....	....
35*b*	3.10	1.280	1.14	.....	.....	....
35*c*	3.30	0.879	0.80	.....	.....	....
35*d*	2.88	0.408	1.10	.....	.....	....
35*e*	4.50	0.660	0.78	.....	.....	....
36	3.48	1.439	0.90	0.025	.....	....
37*a*	2.68	0.900	1.30	.....	.....	....
37*b*	1.90	0.980	1.20	.....	.....	....

No. 31....Sewing machine casting said to be very fluid and good casting. This is an odd analysis. I should say it would have been too hard and brittle, yet no complaint was made.

No. 32....Very good machine casting, strong, soft, no shrinkage.

No. 33....Drillings from an annealer box that stood the heat very well.

No. 34*a*...Drillings from door hinge, very strong and soft.

No. 34*b*...Drillings from clothes hooks, tough and soft, stood severe hammering.

No. 34*c*...Drillings from window blind hinge, broke off suddenly at light strain. Too high phosphorus.

No. 35*a*...Casting for heavy ladle support, very strong.

No. 35*b*. No. 35*c*. Broke after short usage. Phosphorus too high. Car bumpers.

No. 35*d*...Elbow for steam heater, very tough and strong.

No. 36....Cog-wheel, very good, shows absolutely no shrinkage.

No. 37....Heater top network, requiring fluidity but no strength.

No. 37*a*...Gray part of above.

No. 37*b*.....White, honeycombed part of above. Probably bad mixing and got chilled suddenly.

I will not go into details as to the effect of the various constituents in varying proportions on the founding qualities of the iron. That has been done so thoroughly by Professor Ledebur and others, particularly by the former, that I will refer all readers to his books on this subject, as well as on all other practical subjects that come before a furnace manager, and on which I have found him to afford more direct information than perhaps many other authors on the subject.

I will only give a general summary of the main effects of silicon, phosphorus and manganese as shown to us at the time by above analyses and experiments. All the above data, it will be understood, were obtained directly from the foundries in their reports on the working of the various brands.

Silicon.—Between 2.50 and 3.50 per cent. is best adapted for iron that is to carry a fair proportion of scrap and close iron, as ordinarily a casting should not run below 1.50 per cent. silicon to be open and soft. It makes a fluid casting, fairly strong and sound, by its tendency to cause carbon to crystallize when not too high (see Professor Ledebur and others). It makes the iron open, thereby giving a clean, well-filled casting, owing to the slight expansion caused by formation of graphite in casting.

From 3 to 5 per cent. silicon—*i. e.*, silvery iron—will carry heavy amounts of scrap, but tends to make a rather brittle casting if not handled very carefully in casting, as it is liable to give very irregular results if too much or too little scrap is used.

From 1.50 to 2 per cent. silicon has been found to be best adapted for machine work; very little scrap should be used in this case. It will give a very strong, fine-grained clean casting.

Silicon below 1 per cent. seems suited for drills and castings that have to stand great variations in temperature.

Manganese.—The exact advantage of manganese had long been a puzzle to us, until we found the proper solution in Professor's Ledebur's "Handbuch," where he states that manganese, being oxidized more readily than silicon, enables the latter to remain present in greater proportion than if the former were not present, in which case the silicon would be oxidized, and unless very careful allowance had been made the casting would contain too little silicon to cause the necessary separation of graphite. This, therefore, explains the necessity of having manganese present in varying proportions according to the amount of scrap it is desired to carry.

Phosphorus.—Phosphorus, as is generally known, makes the iron more fluid, it retains its heat longer, and is, therefore, good for castings demanding a hot, fluid iron, but its tendency to brittleness when present above ¾ per cent. makes it undesirable where strength is required.

Sulphur.—Sulphur I am inclined to pay very little attention to, as an open, fairly graphitic iron, particularly if it has about 1 per cent. or over of manganese, can hardly contain more than a very small amount, too small to influence the results materially. The conditions in the furnace which make an open iron tend to keep it out, and if manganese is present its well-known affinity for carrying sulphur into the slag makes it easily understood why it plays but a small part in foundry irons.

In fact, in dealing with foundry irons we can only pay special attention to the open grained grades; the closer grades cannot demand attention except as an admixture, when they are treated like scrap is, added according to the grade of the rest of the iron. It is for this reason that I have not taken up carbon at all, an open iron shows in its fracture just about how much graphite is present; hence analyses are unnecessary. Graphite is a necessity and an open grain shows that it is there; that is all that is needed by the founder as far as carbon is concerned.

I now give a series of what we called our "standard grades," graded according to analysis, and on which we based all the brands of the Brier Hill Iron and Coal company:

Brier Hill Scotch Iron Standard Analysis, Grade Nos. 1 and 2.

Silicon	2.00 to 3.00
Phosphorus	0.50 to 0.75
Manganese	2.00 to 2.50

Used successfully for scales, mowing machines, agricultural implements, novelty hardware, sounding boards, stoves, propeller wheels and similar heavy work, chain pumps and similar work requiring no special strength, hardware, carworks, &c. When used for material requiring strength it should be used carefully, with a large amount of scrap. When for material requiring more fluidity than strength it may be used in larger proportions, according to the quantity of scrap or close pig desired to be used with it. Higher manganese may be needed for special purposes, but as that can be added at will in the furnace it need not figure in the standard analysis. The Brier Hill Iron and Coal Company, as the result of these investigations, has succeeded in making a soft foundry iron having all the qualities of the best brands of imported Scotch irons without the use of black band ore, depending entirely upon the ores controlled by the company in the Menominee Range, the Florence, Iron River and Youngstown.

Brier Hill Silvery Iron—Standard Analysis, Grade No. 1.

Silicon	3.50 to 5.50
Phosphorus	1.00 to 1.50
Manganese	2.00 to 2.25

This has been used successfully for hollow-ware, car-wheels, &c., stoves, car-bumpers and similar work, machines, harvesters, scales, &c., of course with heavy amounts of scrap in all cases.

Should mainly be used where fluidity and no great strength is required, especially for heavy work of above description. When used with scrap or close pig low in phosphorus, castings of considerable strength and great fluidity can be made.

Fairly Heavy Machine Iron—Standard Analysis, Grade No. 1.

Silicon	1.75 to 2.50
Phosphorus	0.50 to 0.60
Manganese	1.20 to 1.40

The best iron for machinery, wagon-boxes, agricultural implements, pump-works, hardware specialties, lathes, stoves, &c.,

where no large amounts of scrap are to be carried and where strength, combined with great fluidity and softness, are desired. Should not have much scrap with it, and hence gives more generally reliable results.

Regular Machine Iron—Standard Analysis, Grade Nos. 1 and 2.

Silicon	1.50 to 2.00
Phosphorus	0.30 to 0.50
Manganese	0.80 to 1.00

Used for hardware, lawn-mowers, mower and reaper works, oil-well machinery, drills, fine machinery, stoves, &c. Excellent for all small fine castings requiring fair fluidity, softness, and mainly strength. Cannot be well used alone for large castings, but gives good results on same when used with above-mentioned heavy machine grade. Also when used with the Scotch in right proportion. Will carry but little scrap, and should be used alone for good strong castings.

For axles and materials requiring very great strength we made an iron, Grade No. 2, with—

Silicon	1.50
Phosphorus	0.200 and less.
Manganese	0.80

This gave excellent results.

A good neutral iron for guns, &c., will run about as follows:

Silicon	1.00
Phosphorus	0.25
Sulphur	0.20
Manganese	none

It should be open No. 1 iron.

This gives a very tough, elastic metal. More sulphur would make tough, but decrease elasticity.

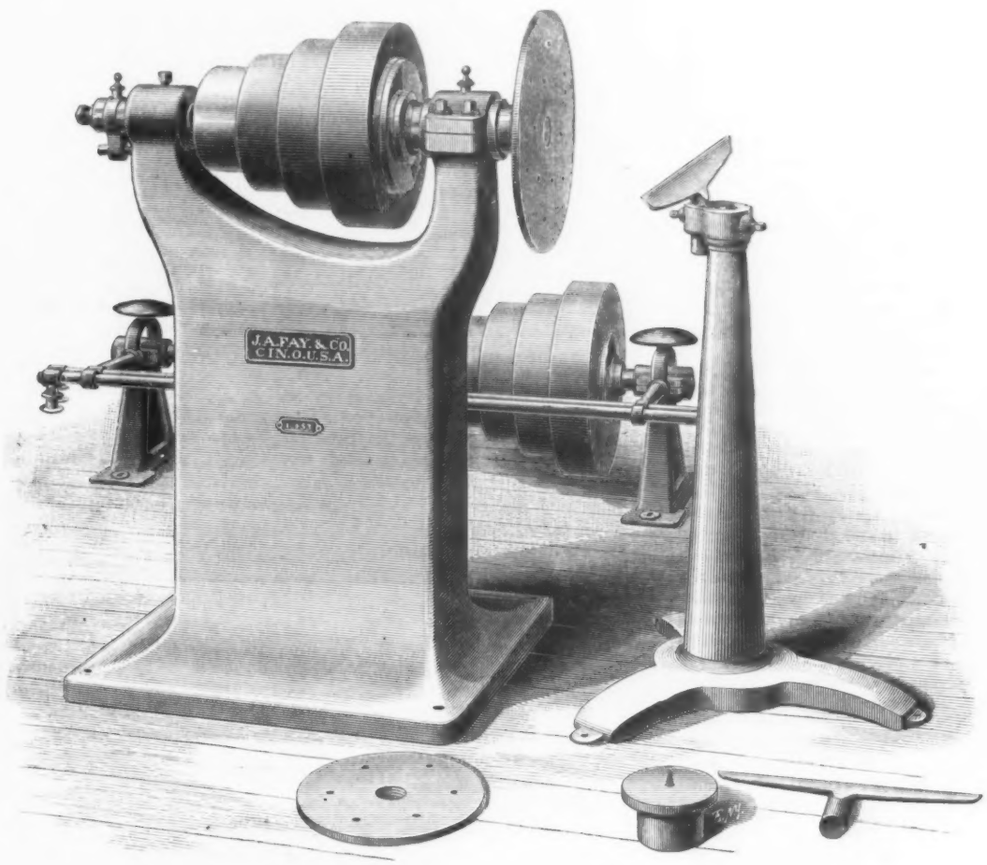
For fine castings demanding elegance of design but no strength, phosphorus to 3.00 per cent. is good. Can also stand 1.50 to 2.00 per cent. manganese. For work of a hard, abrasive character manganese can run 2.00 per cent. in casting.

Large Pattern Makers' Lathe.

Messrs. J. A. Fay & Co., 267 to 285 Front street, Cincinnati, Ohio, are putting on the market a new large pattern makers' face lathe, intended for turning large circular work for use in car and railroad shops, and wherever patterns are required of large diameters, such as those for gearing, water wheels, pulleys, &c.

The lathe, of which we present an engraving on this page, has a very heavy and substantial frame with a broad base, cast in the cored form, and it will swing material 7 feet in diameter. The spindle is made of steel, large in diameter, and carries a cone having four steps, made of cherry. The bearings are long and self-oiling, and arranged to take up wear. The front box consists of a babbited split sleeve, in which the spindle revolves, supported in the frame. The rear box has a conical step, adjustable to the tapering bearing of the spindle by means of a screw. This screw has a separate adjustment, held to its place by a set nut, and comes in contact with the end of the bearing in a self-lubricating chamber. This furnishes the step with a constant supply of oil, and relieves the other bearing of friction.

The countershaft carries a four-step cone to match the cone on the machine, and has two pair of tight and loose pulleys, securing eight changes of speed, to suit all sizes of work.



NEW PATTERN MAKERS' LATHE, BUILT BY J. A. FAY & CO., CINCINNATI, OHIO.

Motor for Coal Hauling.—We are informed by the Corey Coal Company, of Pittsburgh and Braddock, Pa., that they have in successful use the motor designed by Mr. J. B. Corey for hauling coal out of mines. The truck on which the whole machinery is mounted is 16 feet long; the boiler is horizontal, 5 feet in diameter, and 6 feet long, and the working cylinders attached to its side measure 8 x 12 inches. The wheel around which the rope for hauling passes, is 6 feet 4 inches in diameter, and has a groove, with cogs arranged on each side. These cogs mesh with a small gear-wheel on the engine shaft. The rope passes twice around the large wheel, and is fastened at its ends, which are about a mile and a half apart, to levers which take up the slack of the rope and regulate the tension. In this way the motor is relieved from the necessity of depending upon friction on the rails and much greater hauling power is available. One of the machines, we understand, has been in use at the Duquesne Mines for over three years, with very satisfactory results. A new one which is now being built is to be of greater power, with some additional improvements, such as coupling the wheels on the trucks with a chain pulley, so that in case of accident to the rope the motor will be able to work as an ordinary pit locomotive.

Solidifying Russian Oil.—Experiments are still being made under the direction of the Russian Government, with the view of finding a process, at once practicable as well as desirable on the score of economy and cleanliness, of solidifying the petroleum used as fuel. According to the report made by Dr. Kauffmann, who has had the principal charge of these experiments, a successful method of accomplishing the desired result consists simply in heating the oil and afterward adding from 1 to 3 per cent. of soap. The latter dissolves in the oil, and the liquid on cooling forms a mass having the appearance of cement and the hardness of compact tallow. The product is hard to light, burns slowly and without smoke, but develops much heat, and leaves about 2 per cent. of a hard, black residuum.

The Ford & Moncur Stoves.

The Ford & Moncur regenerative hot-blast stove has been in successful use at many of the ironworks in Great Britain, and is now being introduced in this country by Lean & Blair, of Pittsburgh. The stove has been designed to overcome certain defects and objections urged against other fire-brick stoves and difficulties found in their practical working. The inventors have endeavored to combine in it the all-important features of self-cleaning, complete control of combustion, perfect diffusion of the gases and heated currents, together with a simple means of regulating the temperature and of maintaining uniformity in the heat of the blast during the whole time the stove may be blowing. It is claimed that it is no longer necessary with these stoves to have each blast furnace fitted with three or more stoves at a large outlay in plant, three of the Ford & Moncur stoves being found capable of working satisfactorily two of the largest modern blast furnaces.

In the accompanying illustrations Fig. 1 represents a vertical section of the stove through the combustion chamber on the line I, I, Fig. 2, this latter figure being a horizontal section through the central flue leading to the chimney at II, II, Fig. 1. Fig. 3 is a vertical transverse section on the line V, V, Fig. 4, while Fig. 4 is a section taken on the line III, III, of Fig. 3. The combustion-chamber F divides the regulator H into two parts, which are again divided by the wall M, which is carried from foundation to roof. The regenerator is in this way divided into four isolated compartments, each communicating with the large horizontal flue K through the internal valves I. These valves are actuated from the outside. The gases from the blast furnace pass from the flue through the gas valve A into the flues B and B′, and enter the combustion-chamber by the graduated openings C, along both sides of the chamber. The air required for combustion enters by the valves D and D′, passes along the flues E, and enters the combustion-chamber by the graduated openings *e* and *x* placed immediately over the gas openings, insuring a thorough mixture of the two. It will be noticed that the air entering by the valve D supplies one-half of the combustion-chamber, and the air valve D′ the other half beyond the dividing wall M. In this way complete control of combustion is secured over the entire length of the chamber. This air in its passage along and through the hot walls of the combustion-chamber enters the stove at a high temperature. The whole of the compartments are heated simultaneously, the internal valves I being open; the waste gases, after parting with their heat to the regenerator, pass through the large cleaning valve O and the chimney-valve L to the chimney flue.

After the stove has been heated, the air, gas and chimney valves are closed, and the cold blast is admitted by the valve N, and the hot-blast valve Q is opened. If it is required to equalize the temperature over a protracted period of blowing, it can be readily done by closing one or two of the internal valves I, thereby holding a portion of the regenerator in reserve. The cold blast enters by the flue K, passes through the internal valves I, and slowly up through the hot chequer work of the regenerator, impinging on the many thousands of angular staybricks in that structure, then down through the intensely hot walls of the combustion-chamber, passing to the furnace by the hot-blast valve. It will be seen that the combustion-chamber, from its shape and position, thoroughly commands the entire area of the regenerator, and the waste gases being drawn off through the valve I, have no tendency to go direct to the chimney-valve, nor to leave any part of the regenerator untouched. The cross walls in the upper part of the combustion-chamber also afford a very large heating surface themselves, and serve to give a finishing touch to the blast at the most effective point. All the parts of the stove are accessible by the manholes R.

The arrangements for self-cleaning are as follows: The dust carried into the stove by the gas, as well as that deposited from combustion, being of a light, floccu-

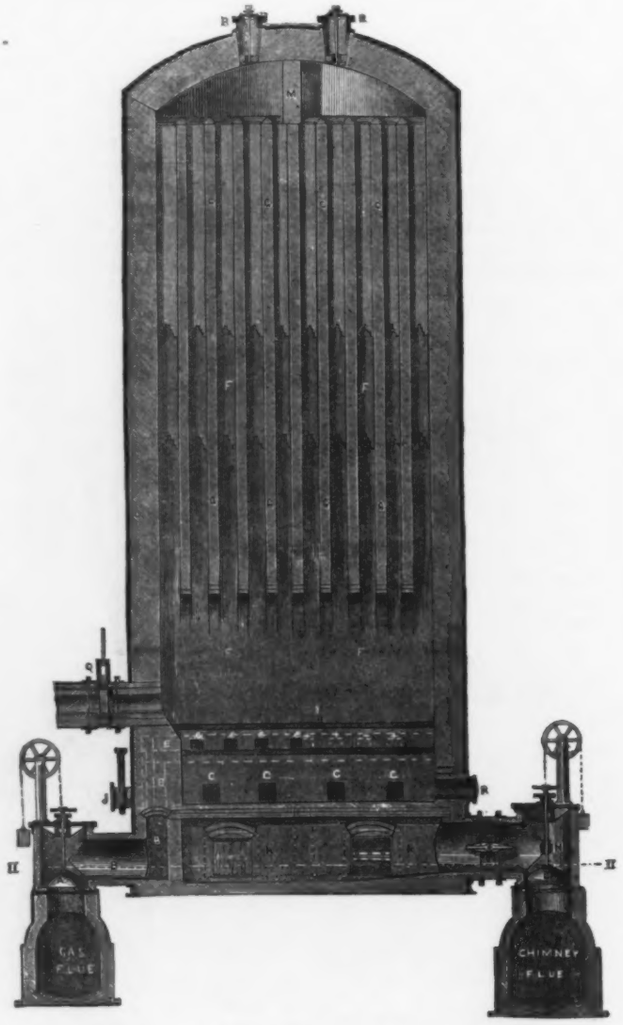


Fig. 1.—Vertical Section through Combustion-Chamber.

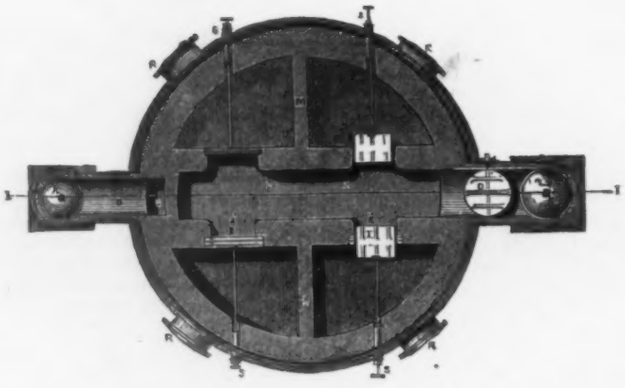


Fig. 2.—Section through Central Chimney Flue.

THE FORD & MONCUR HOT-BLAST STOVE

lent, powdery nature, is easily removed, if not allowed to settle and accumulate; otherwise it is very difficult to remove. The method of removing it in the Ford &

Moncur stove is by utilizing the force of the air in the stove at blast pressure and suddenly discharging it into the chimney flue by the large cleaning-valve O, which is geared to open instantaneously, and, by means of the internal valves I, compelling the discharge to confine itself in its passage to only one compartment of the stove. The high velocity of the current effectually clears away any dust that may have been deposited, and, each compartment being taken in regular rotation at every change from blast to gas, the dust is never allowed to accumulate. The heating surfaces of the stove are thus kept permanently clean. The sluice valves J are for the purpose of blowing out any dust that may accumulate in the gas flues and bottom of the combustion-chamber. These require blowing off once or twice a week.

The regenerator, which is a special feature in the stove, is built dry, and is formed of parallel walls 2 inches or 2¼ inches thick, carried on cast-iron girders. These walls are stayed by special lozenge-shaped brick stays H, pointed to prevent lodgment for dust, and arranged so as to break up the currents and provide the largest extent of heating surface. The gases having full play round these stays in a lateral direction, the absorbing power of the arrangement is very much greater than in the old system of continuous cellular passages, as it is well known that where heated currents are caused to impinge against solid bodies, such as the brick stays in the regenerator, they are more rapidly heated and raised to a high temperature than where the heated currents only rush through continuous perpendicular passages. The clear vertical openings in the regenerator may be of any size to suit the nature of the gases used. The bricks forming the walls being each held in position by the stays at both ends, and in the middle as well, any displacement and consequent irregularity in the vertical openings is avoided, the openings being perfectly true and straight from top to bottom. A novel feature in the stove is that the hot-blast outlet may be placed either at the front or back of the stove, or on both sides, if found desirable to suit the varying arrangements of different smelting plants.

The whole arrangement is the result of an intimate knowledge and careful study of the question, with special reference to the requirements of the hematite and other districts, where the dust deposit from the gas is very great, and has hitherto been a source of much trouble and expense, besides rendering a large outlay necessary for providing auxiliary stoves to take the place of those laid off for cleaning purposes. These stoves are still giving excellent results at the Distington Works, a marked saving of fuel with an increased production being effected by them. They have now been working continuously for more than five years, during which time, it is stated, that there has been no lowering of the heats, and no expenditure for repairs, and no loss of time in cleaning. They are likewise in use at the following works:

Barrow Hematite Steel Company	7 stoves
North Lonsdale Hematite Iron and Steel Company	3 stoves
Darwin Iron Works	3 stoves
Moysten Iron Works	3 stoves
Springvale Furnaces	5 stoves
Charles Cammell & Co., Derwent Works	2 stoves
Distington Iron Works	4 stoves
Maryport Iron Works	3 stoves
Coltness Iron Works	2 stoves
Dalmellington Iron Works	2 stoves
Cleator Moor Iron Works	3 stoves
Total	37 stoves

At the works of the Coltness Iron Company two Ford-Moncur stoves, according to a statement by J. Hamilton, under date of April 20, have been running since August, 1887, effecting a saving of 6 cwts. of coal per ton of iron. At the Barrow Works four stoves are blowing three modern furnaces, while at North Lonsdale three stoves heat the blast for two furnaces,

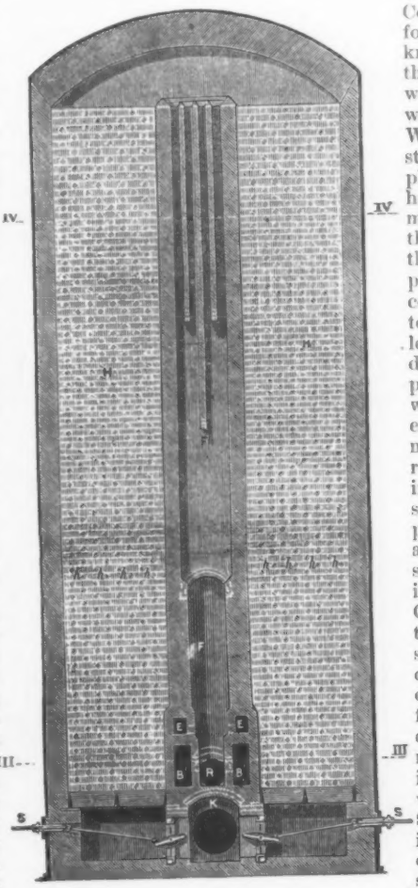


Fig. 3.—Vertical Transverse Section V V, Fig. 4.

Fig. 4.—Horizontal Section III, III, Fig. 3.

THE FORD & MONCUR HOT-BLAST STOVE.

each 20-foot bosh, and 75 feet high. According to advices lately received from England, they are making No. 1 Bessemer pig with 17½ cwts. of coke, which is stated to be the best on record.

The Affairs of Cobb's Iron and Nail Company.

Under date of the 26th ult., O. P. Cobb, president of Cobb's Iron and Nail Company, of Aurora, Ind., has issued the following circular: "We suppose you know our company has been thrown into the hands of a receiver, and we think without sufficient cause, as our company was in much better condition than in 1881. We started business in 1881, with a capital stock paid up of $250,000—but all in the plant, and bonded for $225,000—yet we had a credit sufficient to buy $31,000 of material on our long-time notes. With this meager capital, and a contract with the city agreeing to exempt our real and personal property and the bonds of the company from taxes for 10 years, to get us to hold and run our factory here for that length of time, and with the aid of our individual members, and by adopting our patent process of making nail plate from wrought iron scrap at one heat, which enabled us to dispense with puddling furnaces, squeezers, muck rolls and the old rolling mill, we succeeded by 1886 in paying off the $225,000 of bonds, and, at the same time, increased the size of the nail plant until it is now of greater value than all of the original plant ($250,000). This success seemed to beget a spirit of jealousy in a few persons in Aurora that caused the City Council to repudiate her contract for the exemption of our taxes for 10 years, to such an extent, that the city, in 1887, declared our contract illegal and the taxes delinquent back to 1881, and proceeded to forcibly collect them by levying on all our coal and stopping our entire works for many days, to our great damage by injuring our credit at home and abroad, for which we have brought a damage suit of $41,000. This set the agencies to reporting us badly, and, when we had a breakdown that stopped us for weeks, several suits were brought and creditors applied for a receiver which the court granted. As matters now stand we owe about $110,000 all told. Of this amount Cobb's Iron and Nail Company owe Bradford Iron and Metal Company $13,000, for which they hold a first mortgage; the Cobb's and Greer about $61,000, for which they hold a second mortgage; about $17,000 to parties who have nails in pledge for money loaned to the company; and the balance, about $25,000, is unsecured debts. To meet this we have about $5000 of raw material and stock on hand, besides the nails above referred to, valued at $18,000 to $20,000, and the plant that has cost us $250,000, which shows our total nominal assets to be nearly three times that of our liabilities. Now, it seems to us, if we suffer the plant to be sold in these troublesome times, it will not sell for enough to pay the creditors 10 cents on the dollar. Therefore, we propose that the mortgages be opened up so as to treat all alike and issue bonds or stock to each man in proportion to his interest. The Bradford Iron and Metal Company mortgage is not due. It is on long time and if they refuse to open their mortgage, the Cobb's and Greer have agreed to open their $57,000 mortgage so as to treatall alike. In that way we can prevent the Bradford Iron and Metal Company from sacrificing the property, at any rate, until their mortgage is due, and, inthe mean time, as we have many offers of large bonuses to take our plant where they have plenty of natural gas, raw material and good railroad facilities, we could likely get three times as much money or subscription in stock for locating at such a point as the plant will sell for here under the hammer, if we can agree among ourselves on some plan of action that will enable us to issue new obligations to pay dollar for dollar and accept one of these propositions to relocate, or try to run the mill where it stands."

Wire Rope Fastenings.*

Having had occasion to make some tests of the strength of wire rope recently, the difficulty encountered in obtaining fair results suggests a consideration of the relative merits and defects of the fastenings, of which two distinct kinds are employed—one, the splice and thimble, Figs. 1 and 2, and the other by socket, Fig. 3. Two styles of splices are used—one (Fig. 1) in which the wires after being frayed out at the end, and the rope bent around the thimble, are laid snugly about the main portion of the rope and securely fastened by serving or wrapping with stout wire; the extreme ends which project below this wrapper being folded back, as shown at *a*. The other style (Fig. 2) is by interlocking the strands in the usual manner of splicing, and also wrapping with wire as in the first method, the latter mode of fastening possessing the greater strength. The socket (Fig. 3) is a block with a conical hole in which the rope is secured by fraying out the wires at the end to conform in shape with the conical form of the aperture, the interstices between the wires being filled up with spikes or nails, which are driven in as tightly as possible, and the whole finally cemented with molten Babbitt metal. This is a much neater fastening than either of the preceding, but as usually made, does not possess anything like the strength. In the first tests, the specimens were secured by means of thimbles spliced in at the end, as in Fig. 1. The objection to this mode of fastening is the thimble.

This is usually made of a piece of curved metal bent around into an oval shape, as shown in Figs. 1 and 2, with the groove outside in which the rope lays, and the ends coming together in a sharp point at *x*. In the tests one extremity of the thimble usually wedges itself beyond or past the other, cutting one or more of the strands, and the rope almost invariably breaks in one of the splices. This difficulty with thimbles led me to try some experiments with sockets, notwithstanding the fact that Mr. N. O. Olsen, who conducted the tests, and who had made many tests of wire ropes, had repeatedly stated that no satisfactory test of a wire rope could be obtained with this style of fastening. Moreover, as Mr. Olsen's statement was somewhat of a surprise to me, and as this style of fastening, I believe, is most generally applied in elevators and hoists of all kinds, the matter struck me as of sufficient importance to be worthy of some investigation, if for no other purpose than to determine the holding power of the fastening. The tests corroborated Mr. Olsen's statement, as in every case the rope pulled out of one of the sockets under a load varying from one-half to three-fourths of the breaking load of the rope. The wires pulled out so clean from the Babbitt metal in which they were imbedded, and under such varying loads, that the defectiveness and insecurity of this mode of fastening was very apparent. It is a style of fastening so much neater than the other, however, and so much more desirable a way of securing the test specimens in order to obtain a fair test of strength of the ropes, that the matter seemed to be worthy of further experiment; and having occasion to test a cast steel rope 1½ inches in diameter, a sample was prepared, with a socket at one end of the following construction: The wires, after being frayed out at the end, were bent upon themselves in hook fashion, the prongs of some being longer than others, so that the bunch would conform as nearly as possible to the conical aperture of the socket, and the melted Babbitt metal finally run in as usual. The other end was provided with a thimble spliced as in Fig. 2. The splice, however, was not made long enough, and the strands pulled out under a load of 129,320 pounds. The length of the splice was about 18 inches. The wires in the socket were unaffected.

As it was important to obtain a good test of this rope at the time, as soon as possible, and as some doubts were entertained as to the holding power of the socket, notwithstanding it withstood a load of nearly 65 net tons, the next sample was prepared with thimbles spliced in at each end; the thimbles in this case, however, being made from a solid piece of metal much heavier than usual and circular in shape. Five strands broke in one of the splices, and the other pulled out under a load of 142,800 pounds, which was considerably below the estimated strength of the rope, indicating that the strand which pulled out had borne no portion of the load.

The next rope tested was one of cast steel, 2 inches in diameter, with a wire center or core. As it is difficult and unusual to

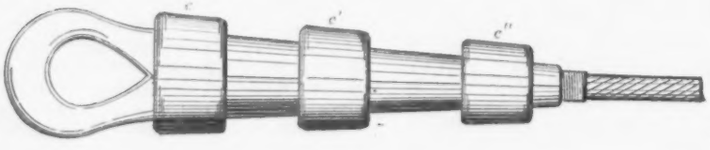


Fig. 7.

Fig. 1.

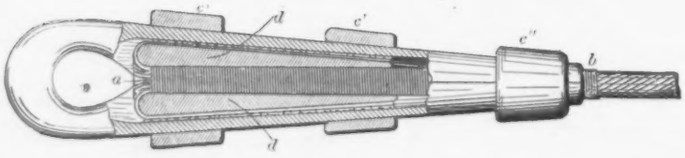


Fig. 8.

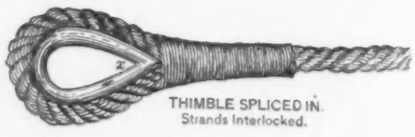


Fig. 2.

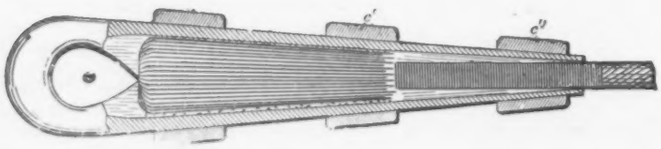


Fig. 9.

Fig. 3.

Fig. 5.

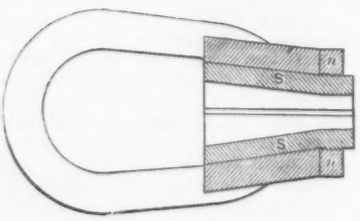


Fig. 6.

Fig. 4.

WIRE ROPE FASTENINGS.

* From a paper presented at the Nashville meeting of the American Society of Mechanical Engineers, by Mr. Wm. Hewitt.

splice thimbles in ropes of this size, and as the last experiment with the socket was so encouraging, the test specimen of this rope was prepared in a similar manner. The wires were so coarse and stiff, however, that it was difficult to lay them snugly and compactly in the socket, and the wires pulled out of one of the sockets under a load of 228,400 pounds (Fig. 4). About 20 of them, however, parted in the socket, the piece taken from the socket presenting the appearance shown at theright. Another specimen of the same rope was then prepared as follows: The wires were frayed out and bent over as before, with the exception of those in the core, the latter being surrounded with a narrow conical thimble or annular wedge, which was driven in tight, forcing the wire of the exterior strands firmly against the socket. The core wires were then bent over like the others, the center filled with some fine steel points, and the molten Babbitt metal finally poured in. Instead of using ordinary loop sockets, however, loop stirrups were employed (Fig 5), which were secured in the testing machine by shackle pins 3 inches in diameter. In this case the wires in the socket, with the Babbitt metal, in which they were imbedded, pulled out about ¾ inch, and the rope then broke under a load of 266,250 pounds. Fig. 5 illustrates the appearance of the specimen after fracture. The U of the left-hand stirrup, which was made of a bar of mild basic steel 2½ inches diameter, was also slightly cracked on the inside of the bend, due to the fact that the bend was made too sharp and opened in coming to a seat against the shackle pin. This rope was made of the Trenton Iron Company's special cast-steel wire, and was composed of six strands, each 19 wires, surrounding a core also of 19 wires, the average tensile strength of the individual wires per square inch being 190,000 pounds. Other data are as follows:

Diameter of each wire	0.137 inches.
Lay of wires in the strand	6 "
Lay of strands in the rope	12¾ "
Length of rope	5 feet.
Length of rope between sockets	3 "
Weight of rope	35 pounds.
Weight of each stirrup	407 "

The aggregate tensile strength of the individual wires amounting to 372,400 pounds, it appears therefore that the strength of the rope was 71½ per cent. of this figure.

Another mode of attaching the socket (and perhaps a better one) is that shown in the accompanying sketch (Fig. 6). The socket is bored out to the desired conical form and fitted with a shell or bushing, S, made in three pieces and provided at the small end with a screw thread. The wires at the end of the ropes are frayed out, but not to such an extent as in the preceding case, and bent back against the body of the rope, some of the prongs being longer than others in order to produce the desired conical bunch or head, which, surrounded by the shell S, is inserted in the socket, the construction being such that the threaded portion of the shell projects below the socket sufficiently to accommodate a nut, *n*, by which the shell is drawn tightly into the socket, thus firmly clamping the wires. Molten Babbitt metal can finally be poured in if necessary.

A socket which meets with much favor in Great Britain is illustrated in Figs. 7, 8 and 9. The sockets are forged in one piece, the eye being afterward bent in. The rope to be socketed is first served with annealed wire from the point *a* to the point *b* (see Fig. 8). The rings *c*, *c'*, *c''* are slipped up over the rope in their respective order followed by the conical-shaped block *d*. The rope is then frayed out from the end of the serving, and the wire ends are so trimmed in layers that when they are bent over the block-cone *d* they will lie smoothly and regularly on its outside surface. The eye of the socket-forging is heated red-hot and bent over the rope and closed on an anvil. The rings *c*, *c'*, *c''* are then driven home to their respective places. To prevent the slipping of the rings the metal of the socket is generally upset against them with a cold-chisel. For still further security the socket is then poured full of Babbitt metal in the usual way. An improvement suggested by the preceding socket, which I have described, is to cut a thread on the lower end of this socket and force the rings up to and maintain them in their respective positions by a nut which would close the small end of the socket, a light gas-pipe sleeve being fitted between each ring.

I regret that the data in connection with these tests is not as complete as might be desired, so that a more interesting comparison of the results could have been made in regard to the strength of the ropes, but I doubt if such data would have developed anything more than was determined by the experiments of the board appointed by the Navy Department in 1876 for the purpose of making certain tests of iron and steel wire and wire rope. The report of this board states that "one specimen of each kind of rope was tested with a splice on one end. It was not observed that the splice was weaker than any other portion of the rope." Nothing further is said, however, as to the manner of securing the specimens in the testing apparatus. The following, however, are a few of the first tests, in which the sockets were of the ordinary style.

Diameter, Inches.	Kind of Material.	Kind of Fastening.	Breaking Load, Pounds.	Where Fractured.
1	Cast steel.	Socket.	27,430	Pulled out of socket.
1	" "	Thimble spliced in.	58,000	Broke in top splice and cut one strand at bottom.
⅞	Swedish Iron.	"	22,430	At bottom thimble.
⅞	" "	"	22,390	At top thimble
¾	" "	"	21,670	At bottom thimble.
¾	" "	"	19,450	Cut at top thimble.
¾	Cast steel.	"	28,870	One strand broke in several places.
¾	" "	Socket.	23,140	Pulled out of socket.
⅝	" "	"	14,290	Pulled out of socket.
⅝	" "	Thimble spliced in.	21,900	Two strands broke in splice.
⅝	Swedish iron.	"	12,730	In the body of the rope.
⅝	" "	"	14,060	In the body of the rope.
½	Cast steel.	"	12,930	Broke a 1-inch pin before rupture; gave way in two strands.
½	" "	Socket.	8,850	Pulled out of socket.

Southern Pig Iron Freights.—The Queen and Crescent route via the Alabama Great Southern Railroad and the Cincinnati Southern Railway has issued its tariff No. 5 on pig iron from Southern furnaces, taking effect June 1. The rates are 20 cents lower than those published in *The Iron Age* of April 26th, page 684.

The Joliet Rod Mill.—Our Joliet correspondent advises us that the construction of the new wire-rod mill at the works of the Joliet Steel Company is making good progress. The iron building is now being erected, the framework is put up and the roof being put on; a good deal of the heavy machinery is on the ground and already in place, and it is believed that the company will be manufacturing rods early in the month of July. It is anticipated that this rod mill—which is of the style known as the Garrett mill—will be equal, is not superior, to any mill in existence in this country. The local demand for wire rods for barb-fence manufacture is large. It is urged that if there were any stability in the matter of tariff legislation it would be more than likely that a second mill would be erected, giving employment to an additional hundred or more men in the near future. It is stated, however, that the present tariff legislation, which has become so active and aggressive since the contracts for this rod mill were made, is likely to put a stop to any further extensions.

The Herreshoff Torpedo Boat.

Work is progressing on the frame and machinery of the new Government torpedo boat, the contract for which at a cost of $82,750 is now in the hands of the Herreshoff Mfg. Company, of Bristol, R. I. The design includes many of the features of the well-known Yarrow and Thorneycroft boats, with improvements and original additions by Mr. N. Herreshoff. The length will be 138 feet. The frame will soon be ready to set up and the boat will be ready to turn over to the Government June 1, 1889, the date specified in the contract. The craft is to have twin screws, each 5 feet in diameter, and the engines of the two yachts already mentioned will be duplicated, a complete engine for each shaft and screw. The horse-power to be developed will thus be 1800, and this tremendous motor force will be required in order to drive the boat at the contract speed of 25 knots. A bonus will be given for all speed in addition to the specified rate required. The firm, it is understood, expect to attain a speed of 28 knots. One of the features is an arrangement of the after lines so that the stern will not drop when a high rate of speed is attained. In the case of the well-known Stiletto, the bow thrusts up high out of water and her stern drops when she is in the midst of one of her bursts. The torpedo boat will be constructed entirely of steel, and will be fitted ready for the torpedo plant to go on board. There will be quarters for 16 officers and men.

The New Navy.—Preparations have commenced at the yard of Messrs. Cramp & Sons, at Philadelphia for laying the keel of the cruiser Newark. The Baltimore's hull will soon be completed, and it is the present intention to have the launch take place on the 4th of July, it certainly being a very appropriate day for it to come off. It is rumored that the President and his wife will be present, and that Mrs. Cleveland will perform the christening ceremony. The engines and boilers for all the above vessels are well advanced in the different shops. Much of the machinery and boiler has been placed in position on the gunboat Yorktown and the dynamite cruiser Vesuvius and their completion will soon be a matter of days only. Secretary Whitney has approved the recommendation of the Naval Board of the Messrs. Cramps be granted an extension of time averaging four months, for the completion of the cruiser Baltimore, the Yorktown and the Vesuvius. The Secretary has also authorized the first payment on the cruiser Philadelphia, amounting to $121,500.

A New Iron Association.

The Mahoning Valley Iron Manufacturers' Association, the formation of which has already been noticed in these columns, is composed of the following named firms:

The Mahoning Valley Iron Company, Youngstown, Ohio.
The Andrews Bros. Company, Haselton, Ohio.
Girard Iron Company, Girard, Ohio.
Ohio Iron and Steel Company, Lowellville, Ohio.
Falcon Iron and Nail Company, Niles, Ohio.
Brier Hill Iron and Coal Company, Youngstown, Ohio.
Cartwright, McCurdy & Co., Youngstown, Ohio.
Youngstown Steel Company, Youngstown, Ohio.
Hubbard Iron Company, Hubbard, Ohio.
Trumbull Iron Company, Girard, Ohio.
Youngstown Rolling Mill Company, Youngstown, Ohio.
Andrews & Hitchcock, Youngstown, Ohio.
Coleman, Shields & Co., Niles, Ohio.
Thomas Furnace Company, Niles, Ohio.
Warren Iron and Steel Company, Warren, Ohio.
Summers Bros. & Co., Struthers, Ohio.

H. O. Bonnell is president of the new organization and J. H. Sheadle is secretary. The headquarters of the association are at Youngstown, Ohio.

The Chicago Steel Rail Mills.

The Union Steel Company, of Chicago, made a remarkable output of Bessemer steel ingots and rails in the month of May just ended. In 50 turns of 12 hours each they produced 28,145 gross tons of ingots with but two converters, and rolled 24,953 tons of blooms and 22,808 tons of rails. This is considerably in excess of any work previously recorded for a month's run. The best week's work in the month was 5486 tons of rails in 11 turns. This is not only a triumph for Robert Forsyth, the manager of the works, and his assistant, W. R. Walker, but also for Mr. Gardner, superintendent of the steel department, and Mr. Jewell, superintendent of the rail department. Messrs. G. and W. Burchett, foremen in the converting works; Clutes and Buehlers, in the blooming mill, and Davis and Walters, in the rail mill, deserve mention also for the part they performed in helping to run up the huge tonnage of the month. The hearty co-operation of everybody was necessary to accomplish such an achievement.

The output of the South Chicago works of the North Chicago Rolling Mill Company in the same month was also very large, but they were handicapped to some extent by having only three blast furnaces in operation, which restricted the supply of direct metal. A whole day was also lost in the rail mill by the breaking of a blooming roll. Notwithstanding these drawbacks they turned out 24,402 gross tons of Bessemer steel ingots and 21,370 tons of rails.

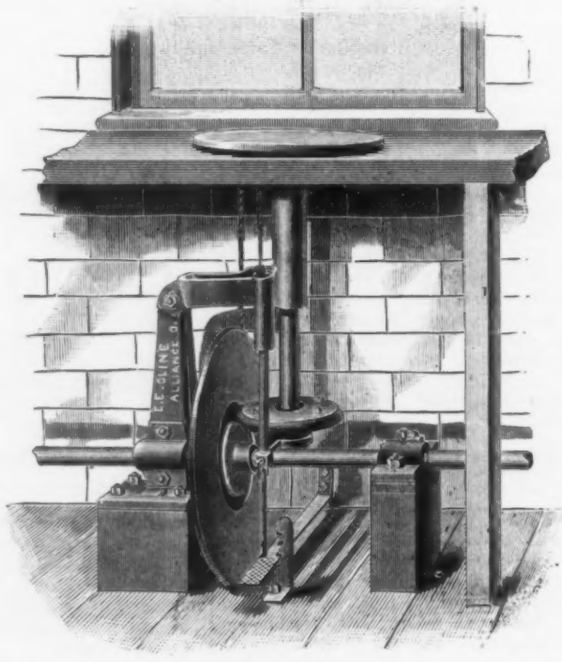
With our steel works capable of such a magnificent production it is unfortunate that the outlook for new business is gloomy, and that their continuous operation is by no means assured for any considerable portion of the future. New railroad enterprises are very slow in maturing, and established lines are economizing in renewals of rails as closely as the condition of their track will permit. The result will probably be another rush of orders beyond the capacity of the mills when the country recovers from the existing business depression. It would be an advantage to all interests concerned if rail orders were distributed more evenly, but financial considerations will very probably in the future as in the past govern the actions of the railroad companies, and compel them to continue their practice of all buying together or all rigidly economizing.

Power Pottery Wheel.

Our readers will, no doubt, be somewhat interested in the accompanying engraving, which represents a pottery wheel run by power, as turned out by Mr. Elmer E. Cline, of Alliance, Ohio.

It will be noticed that there is a horizontal driving shaft, which extends along the entire length of bench should it be desired to use more than one wheel. On some lines as many as ten wheels are connected. The large disks are held in place by set screws, and are adjustable, power being transmitted from them to friction wheels mounted on the lower ends of the upright shafts. These horizontal wheels are practically made up of a rubber band bolted between plates, as shown. A rope running from the top of the treadle-rod has connected to it a weight sufficient to raise the treadle. To throw the friction wheel into gear the treadle is simply disengaged from the notched piece shown in the engraving, and is allowed to rise, carrying with it the vertical shaft and friction wheel until the proper speed is attained; the treadle is then secured by placing it in another notch. It will be readily understood that the rate of speed depends upon the point on the vertical driving disk, between the center and periphery, on which the horizontal friction wheel bears, and this point may be instantly varied by pressure of the foot, changing from slow to fast or fast to slow speed. When at rest the treadle should engage in the lowest notch. The rubber band in the wheel will then stop in the recessed part of the large disk.

The arrangement, we understand, is heartily indorsed by a number of prominent potteries, the output, it is stated, being increased by from one-fifth to one-third as compared with the old form of wheel, especially on large sizes of earthenware. The cost of the power wheels is, moreover, only a trifle higher than that of good ordinary tramp wheels.



POWER POTTERY WHEEL, MADE BY ELMER E CLINE, ALLIANCE, OHIO.

Louisville and Kentucky.

A recent visit to Louisville and its tributary districts in the rich State of Kentucky disclosed many facts of great interest. In the old days of charcoal ironmaking Kentucky enjoyed a very prominent position as an iron State. Its furnaces were famous for the quality of the iron they made, which was transported marvelously long distances to points of consumption, when it is considered how costly such service must have been before the days of railroads. In time, however, the iron interests of other sections of the country were developed, their railroads were multiplied, giving ready access to supplies of raw materials or to points of consumption, and Kentucky saw its market more and more restricted until almost the only active furnaces in the State were those located directly on the Ohio River, and which had been erected to make iron for special purposes with mineral fuel. Notwithstanding the known riches of the mineral deposits of Eastern Kentucky, which had been exploited long ago in the charcoal era, the railroad builders of the continent passed this section for less wealthy regions in which the topography of the country was more favorable for their operations. But the years of neglect which have elapsed have not been without some benefit. The timber on the mountain sides has been preserved, and it will take many years to exhaust the stores of hardwood which there await the advent of the lumberman. A number of influences are now at work to develop the great resources of this State, prominent among which are the Louisville and Nashville Railroad and the Commercial Club, of Louisville. The aim of the Louisville people is both to develop the wealth-producing capabilities of their State and to attract to their city the trade which will thus be created and stimulated. The club is largely composed of young men who realize the necessity of energetic action it they would merely wish to retain for their city the commercial and manufacturing advantages of its location. To the courteous attentions of a committee of the club is due the fact that in a necessarily brief visit much interesting information was obtained.

The growth of Louisville in the last decade has been remarkably rapid. Its population has increased fully 50 per cent. since the census of 1880 was taken, and it is now fast approaching 225,000. The new railroads which have recently been completed to parts of the State hitherto only indirectly accessible to the city will now pour much additional tribute into its lap, and will contribute to its additional growth. With all this increase in population, and the inevitable accompanying increase in business, it is quite remarkable that little effort seems to have been made to "boom" real estate, and for the good of the city it is to be hoped that this conservative disposition may continue. The price of building lots in choice parts of the city is remarkably low from a Western standpoint, and rents are, of course, correspondingly low. Both manufacturers and workingmen are benefited by such a condition of affairs.

A peculiar feature of this city is its pig-iron storage yards. More pig iron is stored in Louisville than in any other city of the Union. It is, of course, principally Southern iron now, but in days past Ohio and Kentucky irons formed the great bulk of it. Two yards are at present in operation. One is owned by George S. Moore and the other by George H. Hull & Co. Ground has been purchased for a third by Kent & Mordue, who will shortly be ready for business. These names will be recognized as those of prominent pig-iron commission merchants. The yards are located near the railroad system of the city, so that cars can be unloaded and loaded at the pig iron piles. Six cents per month per ton is the usual charge for storage, with 20 cents for loading and unloading and 15 cents for weighing. Certificates are issued which are negotiable, and which form a basis for active speculation during certain conditions of the iron market. At present the yards are carrying light stocks, but a good storage business is anticipated if the present depression continues.

THE INDUSTRIES OF LOUISVILLE.

Among the industrial establishments visited one of the most important was the great plow works of B. F. Avery & Sons. Unfortunately these works were not in operation at the time, having shut down a few days previously for annual repairs. A tour through the several departments, however, was impressive in demonstrating the magnitude of this enterprise which was started in 1847. The factory covers 6 acres of ground in the very heart of the city and is now operated by an incorporated company with a capital of $1,500,000. About 600 men are usually employed and 1500 plows and cultivating implements are turned out daily. No machinery is made for sale, but special machines for the company's own use are built in their machine shop which is well equipped. A large foundry forms an important part of the establishment. An interesting feature of these plows is the fact that all the parts of each style are interchangeable, so that repairs are easily made.

The Louisville Steam Forge Company's works were found in full tide of active operations turning out car axles. Scrap iron is mainly used. Six heating furnaces and four helve hammers constitute the equipment, the capacity of which is about 2000 axles per month. The arrangements for piling scrap in these works are very complete. Each man has a bench with scales set in it. He piles the scrap on a piece of board on the scales and carefully builds up the pieces interlaying and locking them together until he has the desired weight. In this way the piles for each weight of axle are of uniform size.

The Louisville Bridge and Iron Company's extensive shops were next visited. They have a fine equipment of steam hammers, presses, drills and other essential machinery, and have erected numerous bridges and other structures through the West and South.

The Louisville Car-Wheel and Railway Supply Company were turning out cast-iron car-wheels at the rate of 150 a day. They have a Colliau cupola 65 feet high and 60 inches inside diameter, in which they have melted 21 tons of pig iron in an hour, using 1 pound of coke to 12½ pounds of iron. At present they anneal all their wheels in draft pits, but are experimenting with closed pits without draft to see what effect the different practice may have. The coke supply for these works is all kept under cover. This is an excellent idea which should be adopted by all foundries. The coke does not get wet and does not otherwise deteriorate with the action of the atmosphere. The shed is large enough to hold several months' stock.

The large stove works of the Lithgow Mfg. Company were found in active operation. These works occupy a tract of land 526 x 204 feet and employ 225 men when run to their full capacity. The foundry is of huge dimensions, having a gangway 526 feet long, extending the full length of the works. The annual output of the company averages 45,000 stoves, which are put on the market under the general name Capitola. At present the working force is actively engaged in preparing a stock of stoves for the coming season. In addition to stoves the company make mantels, grates, hollow-ware and a variety of miscellaneous castings.

One of the greatest manufacturing establishments of Louisville is the cast-iron pipe works of Dennis Long & Co., incorporated January 2, 1878. These works began the exclusive manufacture of cast-iron pipe in 1863. They have been enlarged from time to time, and now include six cupolas, with a total melting capacity of 250 tons a day, in two separate plants located quite a distance from each other. About 500 men are employed by the company, and their products are shipped to the remotest parts of the country. These works consume such an enormous quantity of pig iron that a very large stock is necessarily carried at all times. The purchase of a block of 30,000 tons in a single transaction is not unusual with this company. Dennis Long, the founder of this establishment, was born in Ireland, but learned the trade of molder in Pittsburgh. He is still living and engaged in the active management of the business as president of the company.

Time pressing, not more than a passing glance was permitted at the extensive works of the Drummond Mfg. Company, who make carriage and wagon axles, molding machinery, &c.; Ainslie, Cochran & Co., builders of stationary engines and general machinists; Bridgeford & Co., manufacturers of stoves, proprietors of the Louisville Stove Foundry; Snead & Co. Iron Works, manufacturers of architectural iron work.

JEFFERSONVILLE, IND.

Crossing the Ohio River, the great works of the Ohio Falls Car Company, at Jeffersonville, Ind., were visited. These works occupy an inclosure of about 50 acres, the greater part of which is covered with buildings. When running to their full capacity the various departments employ an aggregate of 2100 men, but at present the force embraces but 1300, owing to the falling off in the demand for freight cars. Passenger-car orders are more abundant. In these works everything is made for passenger and freight cars, except bar iron, axles and goods for upholstering. A sawmill of the most modern type, with a capacity of 35,000 feet a day, is just being erected on the company's grounds to saw lumber from logs which will be floated to them down the river. This will fall far short of their requirements, as they use 80,000 feet daily when running full. They turn out from 20 to 30 freight cars daily, according to the style of car, and one passenger car. Four steam hammers are used in making heavy forging, such as car couplers. Seven engines are used in operating the machinery, the largest being an 800 horse-power Putnam compound, built at Fitchburg, Mass. A small locomotive is also used to transfer material from one part of the works to another. The company make their own coke for foundry use, having a plant of eight ovens and bringing their coal from Pittsburgh. Everything about the works is of the most substantial character, the buildings being almost wholly of brick and isolated sufficiently for fire protection.

Further personal inspection of Louisville's industrial achievements was not possible in the limited time allotted, but attention was directed to the fact that the Kentucky Wagon Works are now erecting a very large brick structure, which it is claimed will be the largest building in the world devoted to this business. In the manufacture of trunks Louisville claims to be second among the cities of this country, Newark being the leader, and that principally because of its export trade. Six large trunk factories are located at Louisville, in one of which a finished trunk is made every two minutes. They use large quantities of sheet iron and hardware. Other lines in which Louisville has won pre-eminence are the manufacture of jeans and tobacco.

The citizens of Louisville may well take pride in the industrial progress now being made by their beautiful city, and turn their faces with hope for an even more distinguished future to follow the development of the natural resources of their State, for which they are making prodigious efforts. Kentucky is well situated geographically to take advantage of every wealth-producing interest to be found or which can be created within its borders. Its coal and iron ore deposits are known to be of great extent and of desirable quality, and proper attention needs but to be paid to their development to make the State the peer of those which through fortunate circumstances have become leaders in the coal and iron trades.

Injector Economy.

Mr. D. S. Jacobus has given, in the last number of the *Stevens' Indicator*, an interesting discussion of the economy due to the use of an injector, in comparision with a direct-acting steam pump, both with and without a feed-water heater, and a geared pump with heater. Although the investigation is theoretical, it seems to be based on reliable data, so that the results, as summarized by Mr. Jacobus in the following table, differ little in all probability, from the figures which would be obtained by actual experiment:

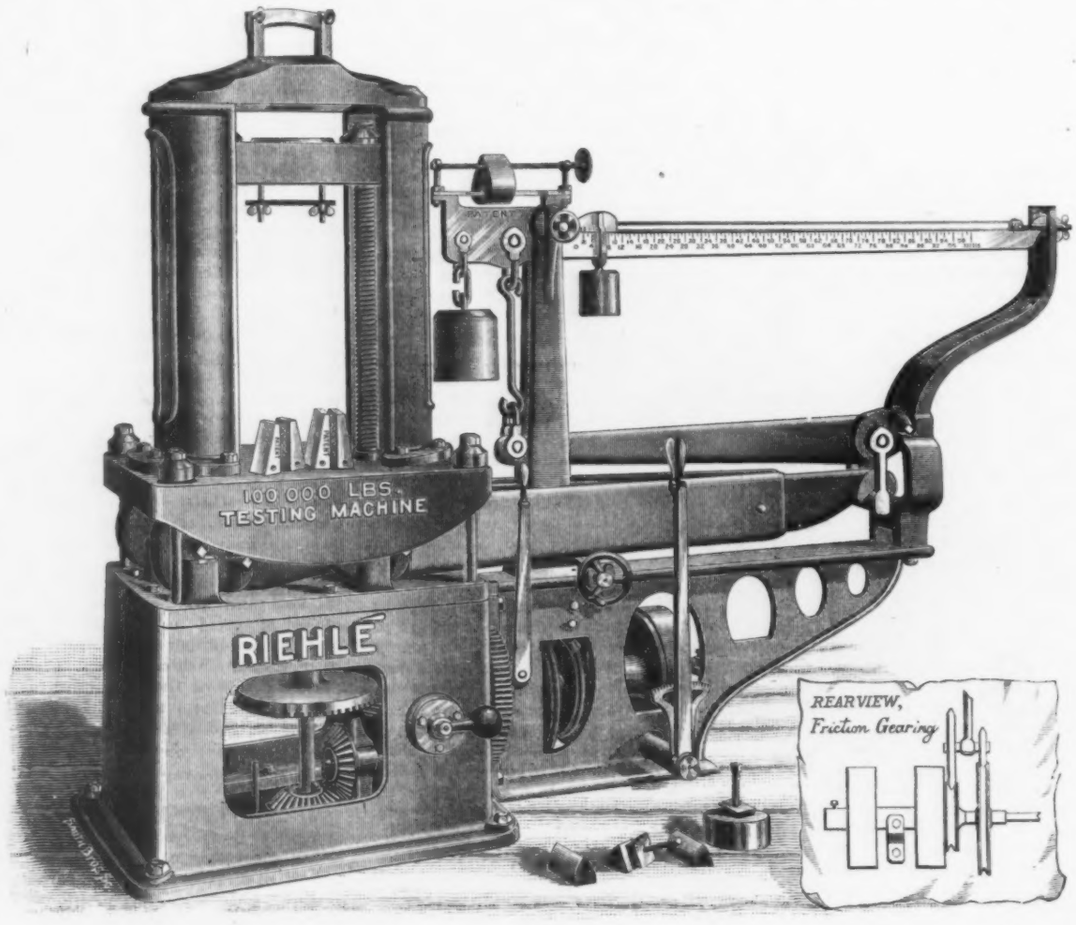
Manner of feeding boiler.	Temperature of Fahr.	Rel. am'ts of coal required in equal times.	Fuel saved over first case, %.
1. Direct-acting steam-pump, no heater. . .	60°	100	0.
2. Injector, no heater.	150°	98.5	1.5
3 Injector, with heater...	200°	93.8	6.2
4. Direct-acting steam-pump, with heater....	200°	87.9	12.1
5. Geared pump, actuated by the main engine, with heater.....	200°	86.8	13.8

Joliet is enjoying considerable prosperity at present, owing to the work at the rolling mills, barb-fence factories, &c. There never has been a time in the history of the city when so many new buildings have been in course of erection at any one period.

Screw-Power Testing Machine.

Messrs. Rhielé Bros., of Philadelphia, Pa., are now building a new and improved screw-power testing machine, of which we annex an engraving. The machine is designed for tensile, transverse or compressive tests, and is constructed entirely of iron, steel and brass, and the levers adjusted to the standard weights of the United States Government There are no less than six different speeds for testing a specimen and four for driving in the opposite direction. This allows of all the possible requirements of a wide range of material. There are no loose weights, and a single traveling poise, operated by a light hand-wheel, registers the strain accurately by means of a vernier. The power is applied and reversed by means of a reversing lever, working in conjunction with a notched quadrant, and throwing a friction-cone in gear, with either open or cross belt, as required.

In tests of compression or of material not ductile, where the pressures run up rapidly, there is an arrangement of friction V-gears, similar to those of a hoisting engine, which gives an extremely slow and steady revolution of the screw, and enables the operator to weigh with ease and accuracy. There are new anti-friction bearings of hardened steel balls, which do away with most of the friction so objectionable in the ordinary screw-power machines. Tools are furnished with the machine for making the various tests, and there are stops and holders for the grips, &c., as well as bolts and cushions for checking the recoil and keeping the platform in place. The levers are arranged in tandem style, so that the machine will take up as little room as possible and allow a clear deck for transverse tests. The machine is being built in the following sizes: 10,000 pounds, 20,000 pounds, 30,000 pounds, 60,000 pounds, 100,000 pounds and 200,000 pounds capacity, and can be built of increased capacity on order.



SCREW-POWER TESTING MACHINE, BUILT BY RHIELE BROS., PHILADEPHIA, PA.

American Tin.—The first pig of American tin has been received by Hibbard, Spencer, Bartlett & Co., of Chicago, and is now displayed in their hardware store. It weighs about 40 pounds, and the word "Dakota" has been molded in one of its sides in honor of the Territory in which the ore was mined. This pig of tin was produced by the Tin Mountain Company, a Chicago corporation, whose mines are located near Custer City, in the Black Hills. The tin concentrates from which it was obtained were received in Chicago some time since, but the special furnace for smelting them has but recently been completed. Further shipments of concentrates are now on the way from the mines, and the production of American tin may be said to have at last actually begun. As usual with pioneers, the company have met with many difficulties which had to be overcome, and they are not yet able to determine the exact cost of the production of tin with the appliances they now have in use. Parts of the machinery have had to be altered, as they were from time to time ascertained to be unsuited to the work or were seen to be susceptible of improvement. Experience had to be gained in this as in all other novel undertakings, and theories have been demonstrated to be either worthless or practical at the cost of much time and money. The members of the company have pushed their efforts to measurable success, despite all discouragements, and now feel hopeful of a satisfactory outcome. It is possible that much may still remain to be done before Dakota tin becomes a factor in supplying the requirements of the country, but it is certain that through the enterprise of the Tin Mountain Company the prospects of a domestic supply have grown very bright.

Friction and Temperature. — Mr. William O. Webber contributes to the May number of the *Technology Quarterly* of the Massachusetts Institute of Technology, an interesting article on "Friction and Lubrication," in which he points out that a warm well lubricated bearing will run with less friction than a cold one. A warm bearing signifies one with a temperature between 130° and 160° F. In support of this statement, Mr. Webber states that in a large number of oil tests made by him (some 2000 or 3000) he has found the coefficient of friction to be greater at temperatures below 130° F. than above that temperature, and that it then falls rapidly until a temperature of from 150° to 160° is reached. At this temperature it remains nearly constant until the oil wears out, after which the friction naturally increases for want of lubrication. An entensive table which is given in the article very clearly illustrates this. This table shows also that the coefficient of friction of lard oil decreases for the first 30° rise in temperature much more slowly than that of mineral oil and afterward more rapidly, but at the end it evidently remains more nearly constant.

THE WEEK.

The annual report of the Duluth Board of Trade indicates the rapid growth of the grain traffic centering at that place. The shipments last year comprised nearly 20,000,000 bushels of wheat and 1,322,000 barrels of flour. The elevator capacity of Duluth is 19,450,000 bushels and will soon be increased.

The steel racing sloop Katrina, just launched from Piepgras's yard, City Island, is much admired. She is 84 feet in length over all and has 83 tons displacement.

President Orr, of the New York Produce Exchange, a representative man in mercantile circles down town, volunteers his opinion in reference to the location for the proposed new Custom House and Appraisers' Department for the City of New York, as provided for by a bill now pending in the Senate appropriating $1,500,000 to the work. Mr. Orr favors an increase of the appropriation to $3,500,000 and the erection of Federal buildings to include Custom House, Assay Office, Sub-Treasury and Appraisers Stores on the property known as Bowling Green Block. In furtherance of these plans an Exchange Committee has recently visited Washington.

The Liverpool and Manchester ship canal, which is to cost $30,000,000, and be built in seven years, will be dredged by German dredging machines, made in Lubeck. The English contractor finds nothing in England to equal them.

Mr. Spreckles, the great sugar refiner, adopts economical methods in clearing the site of his $5,000,000 establishment in Philadelphia. Several hundred Italians are employed, who are said by discontented laborers in the neighborhood to work for "75 or 80 cents a day and live on scraps." The old buildings, which carpenters said could be removed in a week, were carried away in a few hours by indigent people, who received the materials as a gift.

The progress made thus far in preparing conduits and transferring wires from poles to the ground is indicated by Chief Engineer Kearney, of the Board of Electric Control, who said: "We have spent over $750,000 in laying the electrical subways, and have dug about 29 miles of trenches, which contain about 312 miles of single ducts. Through these conduits have been drawn between 4000 and 5000 miles of telegraph and telephone wires, all of which are in use; and the conduits which are still unused among those reserved for the telegraph and telephone companies are being filled with wires as fast as they can get their cables from the manufactory." Additional subways are being laid in the lower parts of the city. Above Fourteenth street iron pipes are used, laid in cement; elsewhere vitrified pipes and wooden logs, likewise imbedded in cement.

The Free Masons of Nebraska are talking about erecting a temple in Omaha to cost $500,000, exclusive of the price to be paid for the land, which will be nearly $200,000.

The magnitude of the brewing interest in the United States is shown by the annual report of the United States Brewers' Association, presented at their convention in St. Paul last week. In 1884 the association consisted of 516 members engaged in brewing. At present it consists of 698 members so engaged. The former number produced 11,978,120 of a total production of 17,349,750 barrels in 1883, as against 5,373,630 barrels produced by 1682 brewers outside the association. Taking the revenue statistics for 1887, it is found that, the total number of brewers being 2240, the production is about as follows: Total, 22,460,335 barrels; produced by members of the association, 18,375,535 barrels; produced by brewers outside the association, 5,084,798 barrels.

A new fast freight line from New York and Boston to the Pacific Coast has been established by way of the Fitchburg, Erie, "Nickel Plate" and Atchison. The Atchison Company is understood to have originated the new scheme, which, it is said, will go into effect on July 1.

The Interoceanic Railway Company, organized recently in London, with £2,500,000 capital, will build across Mexico from Acapulco to Vera Cruz.

Dr. Schliemann's explorations in Egypt show that the great temple described by Herodotus, which occupies a crater-like depression of about 800 feet in the delta, and was composed of great monoliths and columns, had no rock foundation, but rested simply on wet, compact soil.

A disregard of the "long and short haul" principle as embodied in the Interstate law is making trouble in Mexico. The principal grievance appears to be that the capital is prospering at the expense of other localities, freight on goods to that point being rated lower than on shipments from the frontier to rival cities. Hence the city of Mexico gains in importance as a distributing center, giving rise to dissatisfaction.

The annual exodus to Europe by the European passenger steamers is now in full force. Steamers are taxed to their utmost capacity.

It is reported from Paris that Dr. Thomas P. Evans, the American millionaire dentist, has under consideration a project to establish a great industrial school for boys in some part of the United States.

The reservoir of the Montreal Gas Company's works exploded a few days ago, killing four men and destroying property valued at $150,000.

Benj. Baker, the English engineer, is about to take charge of the Tehuantepec Ship Canal and push it forward to completion. The estimated cost of the canal is $40,000,000.

Memphis, Tenn., is said to be the largest distributing point of groceries and provisions for its population in the United States. It sells cotton yearly to the amount of $30,000,000, dry goods to the value of $6,000,000 and miscellaneous wares to the amount of $104,721,000. Its receipts of cotton in 1886 footed up 617,000 bales and the shipments were 621,076 bales.

The President has signed the act authorizing him to arrange a conference between the United States of America and the republics of Mexico, Central and South America, Hayti, San Domingo and the Empire of Brazil.

A tornado swept through the Pennsylvania oil regions on Monday 28th ult., destroyed 1000 derricks in Bradford alone and general havoc was caused in Oil City. Altogether at least 3500 oil derricks were demolished.

Mexican papers call attention to the increased earnings of railroads in that country as affording convincing proof that business is reviving and that Mexico responds to the investment of capital. Of the Central's freighting business in 1887 29.81 per cent. was international.

The annual list of merchant vessels of the United States for 1887 has been compiled under the supervision of Commissioner Morton with unusual accuracy. The volume shows the total number of vessels of all classes to be 24,776, against 25,414 for 1886. This is a decrease of 638. But more than a thousand vessels erroneously retained in last year's list have been omitted, so that in reality there is an actual gain of about 400 vessels. The 24,776 vessels are classified as follows: Sailing vessels, 16,284; steam, 5692; unrigged, 2800.

Reported low water in the Northern lakes has caused some anxiety lest it should embarrass the movement of the larger steamships recently put afloat. A chart, compiled from official data, shows that from 1882 to 1888 the surface of lakes Michigan, Huron and Erie was considerably above the mean level. The water at the present time is about 1 foot lower than the average from 1882 to 1887.

The great Russian railway into the heart of Asia is at last a fact, and the traveler can now go from London almost to the boundary of the Chinese Empire in 12 days. The commercial importance of this event is not indicated by anything visible in the great London dailies. From St. Petersburg the new line runs through Moscow, Wormnesh, Rostov and Vladi-Kavkas. Here the route is barred by the Caucasus range, over which the line is not yet completed. The rich valley of the Oxus, which is the Mississippi of Central Asia, now opened up, had no European outlet before save by caravan. The resources of this territory are of all kinds, mineral and agricultural, and all are undeveloped. All the great mechanical advances and the highest civilization of the nineteenth century will now be carried into barbaric Asia.

An American writing from Tientsin, China, where he is building a house with timber brought from Vancouver, speaks of the "holiday excursion," which before long will include that point in the tour around the world. From Tientsin to New York via Vancouver and the Canadian Pacific Railroad will cost $170, and the journey can be accomplished in little over a month.

The commercial arrangement between Spain and the United States has been indefinitely extended. It would have expired June 30.

Before the 15th inst. the first foreign steamer to navigate the Northern lakes will arrive from London. She is called the Rosedale, and the event, it is believed, will mark a new departure in lake navigation. From the Gulf of St Lawrence she will pass up the river and through the Welland Canal. The Rosedale has been purchased by the Merchants' Line of steamers plying between Chicago, Montreal and intermediate points. She was built at Newcastle-on-Tyne for coastwise trade.

The riches of Cuban forests are the theme of a correspondent, filled as they are with oak cedars, a tree resembling California redwood called almiqui; also mahogany of tremendous size and many other varieties. The writer says: "There the stateliness and grandeur, as well as value, of these forest trees are almost incredible. To illustrate, in the wilderness between the old walled town of Holguin and the sea, at Sepa, where the forests are almost impenetrable, I have a friend who, at a venture three years since, purchased a tract of nearly 30,000 for $50,000. All commercial New York laughed at him, but he went there and began in a modest way cutting and shipping mahogany. To-day he is worth $5,000,000, has 300 yokes of oxen, employs over a regiment of men, lives like a lord in a palace of mahogany, and practically has not yet touched his giant trees. Throughout the whole island, with its total area of about 46,000 square miles, I would say that, at a moderate estimate, one-half, or fully 23,000 square

miles, of the entire area is covered by virgin forest. At a no greater price than is now paid for large tracts of American pine "stumpage" the untouched forests of Cuba are to-day worth $15,000,000. But as every acre holds woods worth far more than $10,000 in the markets, and every standing tree, at the remotest distance, is not 75 miles from an accessible seaport point, the ridiculously low estimated value of $100 per acre, would give a total valuation to Cuban forests, exclusive of all expense of lumbering and marketing, of over a billion and a half of dollars!

Rochester, N. Y., is preparing to introduce natural gas from Northern Pennsylvania by means of an 8-inch pipe, the same dimensions that are used in supplying Buffalo, which receives gas from a point 87 miles distant.

Coal ballast is being taken in considerable quantities of late by steamers leaving for Europe in lieu of grain.

Electric light contracts were awarded by the electric light commission as follows: Brush Electric Lamp Company, 44 lamps at 35 cents per lamp a night; East River Electric Light Company, 211 lamps at 35 cents; United States Electric Light Company, 270 lamps at 35 cents; Ball Electric Light Company, 48 lamps at 27½ cents; Mount Morris Electric Light Company, 61 lamps at 30 cents; Harlem Lighting Company, 49 lamps at 50 cents, and North New York Lighting Company, 33 lamps at 35 cents.

St. Louis manufacturers last week engaged in a public discussion occasioned by the proposed ordinance to prevent smoky chimneys. Most of them affirmed that no device for consuming smoke had yet proved successful.

The Pacific Mail Steamship Company in their annual report speak of the competition from new lines and subsidies granted by the Imperial and Dominion Governments and the necessity of obtaining new vessels with modern appliances. To this end arrangements have been made for the construction of two new steel steamers. The report urges a more liberal policy on the part of the Government in the matter of subsidy and compensation for carrying the mails. The earnings of the Atlantic line were $807,000; the Panama line $1,778,274; the trans-Pacific line, $1,334,384, After deducting $326,648 for extraordinary repairs, the net earnings are $440,429.

So far from taking undue advantage of their recent triumph over the journeymen brewers in this city, the United States Brewers' Association, at their convention in St. Paul, voted unanimously that they would oppose any scheme for reducing wages or increasing the hours of labor, and that they would refrain from any attempt to interfere with the organization of their workmen into unions. The president of the Brewers' Association, William A. Miles, of New York, urged its members to make a study of the labor question as employers and as American citizens.

Speaking of the peril of fast-going ocean steamers during the prevalence of fogs, Captain Kennedy, late commander of the White Star liner Germanic, makes a strong point by suggesting that if a code of sound signals, giving certain blasts for each point of the compass, were adopted and made compulsory in ocean navigation, the safety of the voyage would be materially enhanced.

The scarcity of water at fires down town in this city, after the heaviest rainfall in May for 18 years, is somewhat remarkable.

Prominent citizens are endeavoring to secure adequate appropriations at Washington for the Harlem River improvement, which will save a detour of 20 miles around the city now made by vessels passing from Long Island Sound to the Hudson River. The estimated cost of the work is $2,000,000.

The arrivals of vessels at this port in May, both foreign and coastwise, were smaller than for the same month in several years. Of the steamships only 19 were American out of a total of 225, including 123 British.

William L. Baker, a graduate of the Troy Polytechnic Institute and actively connected in the service of the Detroit Bridge and Iron Works, died at his residence near Detroit on the 28th ult., aged 38 years.

Beginning on July 1, all plumbing in new houses will have to be tested by pressure to make sure that joints are tight and the material good. The rules which will then go in force by order of the Health Commissioners provide that the plumbers shall test all the drain and vent pipes in the presence of a plumbing inspector by a pressure test to be applied by the inspector. Proof that the test has been made will be required by the Department of Public Works before connection with Croton water mains will be permitted.

The Royal Mint in Corea, on March 15, issued the first of the coins which have been struck there in the European style. It is of bronze and identical with one of the coins circulated in Japan. About 80,000 of them can be struck in a day.

The Japanese Government have ordered from France the materials for two steel war steamers to be constructed in the Yokosuka shipyard.

The completion of the Cascade Tunnel on the Northern Pacific Railroad marks an important event in railway traffic on the Pacific Slope. It means the saving of an entire day for freight between St. Paul and Tacoma as compared with the route over the "Switchback," now abandoned, and enables the road to take all the freight offered, which was impossible heretofore.

A report to the Legislature of Massachusetts upon the disputed question of prison labor says the new law in that State has not yet had a sufficient trial to test its practicability.

The growth of Chicago in population and trade is shown by the annual report of the Board of Trade, just published. The population of Chicago in 1840 was 4853; in 1855, 60,726; to-day it is about 800,000. Its total valuation in 1857 was $36,335,281, and in 1887 $161,204,535. The total shipments of flour and grain in 1857 were 18,000,000 bushels; in 1887, 154,658,224 bushels. The receipts of corn for 1857 were 7,409,130 bushels; in 1887, 50,467,814 bushels. The total number of hogs, alive and dressed, received for the year 1856–7 was 220,702. The receipts of lumber in 1857 were 459,639,189 feet; in 1887, 1,880,168,000 feet. The total tonnage of vessels which arrived in the district of Chicago in 1857 was 1,753,413; in 1887, 4,421,560. The shipments of cattle, hogs, sheep, calves and horses amounted last year to 3,110,689, as against 3,107,416 in 1886.

The new president of the Board of Lifesaving Appliances is Capt. Edward Burgess, of Boston, the well-known yacht designer.

The Maritime Exchange in this city has published a number of interesting reports on the use of oil at sea, showing in frequent instances that it is effective in calming down the turbulent waters and thus averting disaster.

Prof. J. W. Powell, director of the Geological Survey, was given a hearing by the House Committee on Agriculture in support of the Symnes bill for the development and utilization of the water resources of the arid regions for the purpose of irrigation. Professor Powell asserted that 50,000,000 acres of arid land could be reclaimed by means of the system of irrigation proposed.

The *Nation* gives portions of a recent letter by M. Paul Leroy-Beaulieu, in which it is claimed that a revival of business is in progress in France despite the depression of agriculture. He sees evidence for this opinion in the gradually improving dividends of the finance, industrial and navigation companies and the railroads, and in the gradually increasing yield of the general taxes and the octroi of Paris. The only drawbacks to French prosperity, in his judgment, are the Panama Canal folly and political disturbance.

The New German Minister to Washington, Count Arco Valley, was lately German Minister to Egypt, and in 1871 was secretary of the German legation at Washington.

Some of the contractors who have undertaken the construction and equipment of the New York arcade railway, are: The Phœixville Iron Works, of Pennsylvania; Bartlett & Hayward, the Architectural Iron Works, of Baltimore, Md.; R. Dickinson, of this city, chief engineer of the Poughkeepsie Bridge Company; Henry J. Davison, a mechanical engineer, of this city; Ryan & McDonald, railway contractors.

H. K. Thurber, president of the United States and Brazil Mail Steamship Company, in a communication intended for the public press, speaks of the hardships experienced by this American line, which, since January 30, 1885, has carried the mails gratuitously rather than accept the beggarly sum of 9 cents per mile, while the Government is paying about $1.30 a mile to a steam line in the European trade. The foreign line, moreover, is released from the payment of tonnage dues, which, at the same rate paid by the Brazil line, would amount to $13,000 per annum. The writer asks: "Why should we not have the same system of paying for conveyance of mails on the ocean as we do landed service? Why should our steamers be obliged to pay tonnage dues that foreign vessels are released from paying?" Senator Fry's amendment to the Post Office bill appropriates $400,000 as a subsidy for carrying the Brazilian mail.

The 53-ton Gun.—In view of the attention now centered in the Navy, it may not be without interest to point out that the new 53-ton gun recently completed at the South Boston Iron Works is shortly to be tested at Sandy Hook under Government supervision. The gun is of the French type, and is a 12-inch, breech-loading, cast-iron rifle, hooped and tubed with steel. It is 30 feet long. The standard of the trial is 500 rounds, using an 800-pound projectile and a charge of 265 pounds of powder. At the South Boston Works two built-up steel rifles are also in partial construction. These have 8-inch bores, and are entirely of steel. Two 8-inch pneumatic gun carriages for rifle use are also in progress, as well as four 10-inch carriages of a smaller type for use on the monitor Terror. The 10-inch steel breech-loading rifle which was recently tested at Annapolis and which is one of those designed for the iron-clad Miantonomah, is 27 feet 6 inches long and weighs 58,000 pounds exclusive of carriage. It fires a charge of 250 pounds of cocoa powder and a 500-pound shell.

The Wallingford Wheel Factory, at New Haven, was struck by lightning and burned. The loss is between $50,000 and $60,000.

The Iron Age

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The South in the Iron Trade.

The United States is a country of such enormous extent and marvelous natural resources that the opening up of new areas of manufacturing industry in its territory is inevitable. The progress in this direction has been unchecked, save temporarily, from the time when public attention was first given in the infancy of the country to providing improved means of intercourse and transportation between the scattered settlements, and it will continue as long as an opportunity for profit is perceived by the restless and enterprising American. In recent years the multiplication of railroads and the consequent heavy reductions in freight charges have been potent elements in rapidly bringing to light fresh opportunities for the establishment of profitable industries. At present the most important developments of this character are in the South. In Alabama and Tennessee blast furnaces and rolling mills have risen as if by magic, and the charm of material advancement, with its accompanying prosperity, is strongly felt in every circle penetrated by the influences radiating from the points in these States which have already become industrial centers.

Those who are immediately identified with the iron industry of Alabama and Tennessee are imbued with the faith that in these States the progress thus far made has been but a beginning, and that it is their manifest destiny to lead the other States in the race for supremacy in the iron trade. They are encouraged in this belief by the great strides they have already taken, these two States having produced over half a million tons of pig iron last year, which will be greatly increased with the starting of new furnaces this year, while still more furnaces are projected. Their iron ore deposits are being more thoroughly investigated, with the gratifying result of finding new bodies previously unknown. Last year's coke scare has dissolved into thin air in the presence of increased openings of coking coal and the rapid erection of coke ovens to meet the heavy demand. So far as the necessary materials of iron making are concerned, these States possess them, and in abundance, too. They lie so close together that the freight charges on assembling them at the furnace are merely nominal.

It is possible that the cost of producing pig iron in Alabama and Tennessee may not be so low as some enthusiastic friends of Southern iron development have claimed, but the fact is plain that it is produced cheaply, and it is being sold at a price which secures its entrance into the general markets of the country. As to quality, the furnaces of these States are able to show a very good record in the manufacture of pig iron for general purposes. Within two weeks one Birmingham furnace shipped iron to Pennsylvania, Florida, Texas, Colorado and Massachusetts. Price and quality were both considered in these sales to such remote points, in competition with the iron from other sections.

These facts may well stimulate the faith of Alabama and Tennessee iron manufacturers in their future. The price of iron may be so depressed by the diminished demand that some of them will find it unable to make both ends meet, and they may have to retire from the race, but this happens in every section of the country and in every branch of industry. New hands will be found outstretched to take control of crippled works, and fresh backs will be bent to receive the burden. The iron-works of this part of the South are too modern and too well built to be permitted to lie idle should financial disaster overtake their owners. And when another great wave of prosperity returns to the country it will need all the iron these Southern furnaces can make to supply its ravenous appetite.

The problem as to how far Southern iron will displace Northern iron in ordinary times is too deep for early solution. As the South produces but little Bessemer pig iron, that special product of the North is still free from competition. The steel-making processes of the South, in which their ordinary pig iron is to be used, have not been developed sufficiently to indicate their actual value, so that Bessemer pig iron is not yet affected in that direction. But in foundry and mill grades of pig iron it is evident that the appearance of Southern iron as an active competitor has caused prices to recede to a point which tests endurance. The competition which is now in progress may go far toward fixing the status of Southern pig iron in the markets of the country. It will supplant the product of those furnaces which cannot be operated when the market price of their iron falls below a certain figure. But the majority of the best Northern furnaces have an advantage in some respects through which their cost is more or less elastic and will be reduced under sufficient pressure. The extent of that elasticity it is impossible to determine, but the depression which now prevails may reveal it before the course of prices again turns upward.

Valuable official data on the wages paid in Germany are being accumulated through the agency of the associations formed under the compulsory insurance laws of that country. For the year 1886 the average yearly income in a number of industries in different parts of the empire were as follows:

Southern Iron and Steel Association	1,040	marks
Rhenish and Westphalian Iron and Steel Association	953	"
Iron and Steel Association of Thuringia and Saxony	946	"
North German Precious and Base Metal Association	893	"
South German Precious and Base Metal Association	850	"
Northeastern Iron and Steel Association	839	"
Rhenish and Westphalian Machinery and Hardware Association	826	"
Northwestern Iron and Steel Association	805	"
Southwestern Iron Association	788	"

These all rank among the 30 associations in different trades and industries in which more than the normal average rate of wages is paid. Only one — the Silesian Iron and Steel Association — paying annual wages of 567 marks, lies below that rate, which is placed at 600 marks per annum. From these data it would appear that $150 per year is considered the normal income of a German workman, the average among the iron makers fluctuating between the range of $200 and $250.

The Decline in Silver.

During the last two weeks in May the London quotation for silver dropped to 41⅞d. per ounce, recovering to 42d., and in New York the quotation for fine bars was down to 91 cents, these being the lowest prices since the latter part of 1886. The decline is all the more significant just at this time since it is an important factor in the shipment of wheat from India to Europe, and that crop is now being actively marketed. Besides, it materially affects the price of all produce and merchandise shipped from the East. From the sources of production of argentiferous lead in America, and also Spain, come reports that owing to the present low price of silver the output of silver lead ores will be curtailed until some improvement is visible in silver. Since the middle of the century the world's silver production has increased as follows:

Average Production of Silver in Kilograms.

	1851–60.	1861–65.	1866–70.
In the United States	7,250	174,000	301,000
Mexico	456,950	473,000	520,900
South America	204,500	191,100	229,800
Germany	55,235	68,320	89,125
Other countries	171,617	194,730	198,260
Totals	895,552	1,101,150	1,339,085

	1871–75.	1876–80.	1881–85.
In the United States	564,800	980,673	1,137,479
Mexico	601,800	655,800	753,600
South America	274,700	350,000	430,000
Germany	143,080	163,779	232,630
Other countries	285,045	300,000	308,000
Totals	1,969,425	2,450,252	2,861,709

In 1886 silver production aggregated 3,100,000 kg.; the official details for 1887 are not yet given, but the impression prevails that there has again been an increase over the previous year. As will be seen from the following table the exports have again exhibited a growth:

Exports of Silver from Mexico.

1886–87	$33,560,000
1885–86	29,906,000
1884–85	33,128,000
1883–84	33,473,000
1882–83	29,629,000

There are at present in operation in Mexico 324 silver mines, employing over 100,000 miners and other operators. Eleven of the mines alone produce annually together $25,000,000 of silver.

Between native and imported ores Germany turned out, as per official returns, the following amounts of silver:

Production of Silver in Germany.

	Kilograms.		Kilograms.
1876	139,779	1882	214,982
1877	147,612	1883	235,063
1878	167,660	1884	248,116
1879	177,507	1885	309,418
1880	186,011	1886	319,598
1881	186,990	1887	367,634
Totals	1,005,559		1,694,811

In 1878 Germany extracted from foreign ores 43,500 kg.; in 1884, 88,000 kg.

The annual production of silver in England from foreign ores averages 120,000 kg. In 1886 the import of silver ores

into England amounted to £1,030,488, of which £270,759 came from Spain and £219,537 from Australia.

During the five years, from 1882 to 1886, the United States produced the following amounts of silver:

Production of Silver in the United States.

	Ounces.	Worth.
1882	36,197,695	$46,800,000
1883	35,733,622	46,200,000
1884	37,744,605	48,800,000
1885	39,910,279	51,600,000
1886	39,445,312	51,000,000

Bolivian production is estimated at present at something like $25,000,000 annually, Chilian at 160,000 kg.

Technical progress in mining and in the treatment of ores, greater facilities in and cheapness of transportation have all co-operated to increase silver production in spite of the depreciation which has been going on. The latter has been something extraordinary, as the ensuing little table will show:

Average Price of Silver in London.

Pence per Ounce.

1841-50...59⅝	1876....52¾	1882....51⅝
1851-55...61¼	1877...54 13-16	1883...50 9-16
1856-60...61⅝	1878...52 9-16	1884...50⅝
1861-65...61¼	1879...51¼	1885...48⅝
1866-70...60⅜	1880...52⅛	1886...45⅝
1871-75...59	1881...51 11-16	1887...44⅝

On January 1, 1888, the ounce was worth 44 $\frac{9}{16}$d., equal to 96¼ cents, in New York, on May 16 it stood 41 $\frac{5}{8}$d., equal to 91 cents, and recovered to 42d., equal to 91¾ cents, toward the close of the month.

Neither the Latin Union and its prolongation, in Europe, nor the operations of the Bland bill among us, nor any other legislative measure of any kind have been able to arrest the downward course of silver values. Production may meanwhile slacken for a time in one country, but the total output will, from all present appearances, go on increasing unless revolutions in silver-producing countries south of us should stem the tide there materially, but neither in Mexico, nor in Bolivia is there any apprehension of the kind. Sooner or later the Bland bill must be repealed, and silver will then be left to steer its course without an effective artificial prop anywhere, for internationally nothing can be done in its favor.

Prominent former bi-metallists, like, for example, Professor Lexis, now acknowledge that nothing practical can be devised through international agreement. To try to interfere with or dabble in silver in any shape is indeed but wasting time to no purpose. Last year an attempt was made to establish speculative trading in silver in this city by placing it upon the call list of the Stock Exchange and arranging for the issue of certificates against deposits of bullion in a designated bank, as if we had not commodities enough to speculate in on paper in our various exchanges. The call was kept up for a few weeks, and gradually the whole scheme that had been inaugurated by a couple of silver monomaniacs with quite a flourish of trumpets and many predictions that New York would soon become the leading silver market, has entirely disappeared and been forgotten even by those who advocated it.

Something more tangible has been the speculation in argentiferous lead mining shares that has lately been rampant in Melbourne, Victoria. The shares forming the center of attraction and manipulation were those of the Broken Hill Mining Company, nominally worth £20. The market value of these shares stood £174. 10/ on January, 1888, and on February 15 last they were pushed all the way to £380, so that the entire share capital of £320,000 reached the fabulous market value of £6,080,000. According to the Melbourne *Journal of Commerce*, 30 new mining companies were started in March last, with a total share capital of £3,250,000. If Australia is to enter the lists of leading silver-producing countries in a prominent manner in the future, the prospects of seeing silver rally once more will become gloomy enough.

The Chemistry of Foundry Iron.

We print elsewhere the first of a series of papers on the chemistry of foundry iron from the pen of Carl A. Meissner, which deserve the careful consideration both of makers and melters of foundry pig. The data submitted were mainly gathered a few years since, in connection with work carried through for a leading producer in the West, and as such represent the pioneer efforts made in this direction in this country. It is not claimed, nor can it be expected, that missionary work in a new field could meet all the questions and settle all the doubts which must arise in so intricate and perplexing a subject. It will take years of patient effort and earnest co-operation on the part of furnacemen and founders to reach the goal of both, a clear understanding of the relations existing between chemical composition and the qualities of foundry irons from the standpoint of the founder. The latter, under the necessity of depending principally upon something more reliable than fracture, will probably work in the direction so ably followed by Mr. W. J. Keep, of Detroit. A study of the data thus accumulated, coupled with chemical analysis and of the tentative work in other directions, must aid the pig iron manufacturer. Sole reliance upon chemical work, without a careful consideration of the conditions of temperature, &c., under which an iron is produced and is used, can only yield partial results. To the furnaceman chemical composition is the simplest guide. He can to-day make a product to come very closely up to a given specification. If he can accumulate evidence enough to satisfy himself that a certain chemical specification will produce results desired by the founder a vast amount of uncertainty and of friction will be removed. But it would be unwise to insist that the founder must accept his dictum as to what he wants in his own work when after all it can only be a guide to the manufacturer. In other words, the burden of ascertaining what relations exist between chemical composition and the properties of good foundry iron lies with the furnaceman. On the other hand, the interest of the founder lies in closely following progress in this direction, since it will afford him many opportunities for simplifying experimental changes in mixtures.

An interesting point brought out by Mr. Meissner is that the dread of founders of the presence of manganese in their mixtures is unfounded. His conclusions on this and other features are presented with the purpose of bringing out additional evidence which may have been accumulated by American furnace managers or founders. Both have too often suffered from the uncertainties of the present rough methods of grading by fracture alone not to be eager to aid in developing a more scientific and more reliable system.

Railroad Consolidations.

Rumors have found their way of late into the daily papers regarding the consolidations of some of our strongest railroad systems. The Pennsylvania Company was reported negotiating for the Burlington road, while the Santa Fé, according to the same authorities, had nearly completed the purchase of the Erie. These rumors have been denied, but they at least show the direction which acute observors expect our railroad development to take. There is no denying that they have reason for their opinion. New England is a good illustration of the tendency. From a territory of many short and local roads, it has become the home of a few systems. The Boston and Maine will soon be absolute in its way in the North; the New Haven is uniting its branches in the South; and on the East the Old Colony. Very soon no independent short road will be left. The Boston and Albany long ago should have made itself powerful by seizing upon important feeders now fast falling into other hands. Perhaps, it has missed its destiny. In the West, the different systems are being extended and absorption or amalgamation is not an improbable future for a number of them.

In this process of consolidation the railroads are but yielding to the same forces in our industrial situation which, in the shape of trusts and combinations in trade, are now troubling our legislators. In trade matters he who can frame a prohibition of trusts which will not forbid the benefits of combinations will deserve well of his country, but railroads present some special features. Free and, as we may say, reckless railroad building has in the past done much toward the growth of our nation, but now the bad effects are more apparent. Defects in the planning are shown by the stress of our conditions. If a railroad has not wisely selected its route, so that it can gather traffic from other roads or from self-sustaining localities—if it begins and ends "in the air"—it is useless for it to complain of any State or national legislation as solely responsible for its misfortunes. The water courses—rivers, canals and lakes—must always powerfully affect the basis of rates, whether any particular line suffers from such conditions or not. Thus modern competition is intensified, and as in trade our "trusts" are sometimes attempts to avert from old plants the disasters of rivals with new processes, so in transportation combination is the only hope for many an old road no longer able to do a small business at high rates.

The prohibition of pooling is a great incentive to amalgamation. It is no longer possible to support a road having dangerous possibilities by contributions forced from an unwilling pool. This always had somewhat the look of blackmail. Now, if the road is existing only on its capabilities for mischief and not on any traffic, legitimately belonging to it, let it be estimated at what it is really worth. Combination means the possibility of cheaper production. The question of importance in this connection regarding

transportation is, Are we sure that the public will get the promised benefit from these consolidations, present and to come? It is not reasonable to expect this without some regulation by Government.

Professor Adams divides our industries into classes according to their relation of profit to capital. If doubling the capital will give not much more than double the profit, there is no danger of permanent monopoly. Anybody can produce nearly as cheaply as anybody else. But when doubling the capital will permit the increase of the profit three or four times, then such industries are natural monopolies and sooner or later require Governmental control. Railroads under combination are classed in this latter category. This whole subject will shortly be taken up in the United States Senate, and no doubt some Senators can be found to argue from the shortcomings of our laws the futility of any legislation regarding transportation. But if Professor Adams's theories be true, we are likely to need in the future more rather than less restraint upon carriers, but always with the remembrance that our railways were built with private capital. Confiscation cannot follow combination. It is rumored that the Reading Committee in Congress will recommend throwing into the hands of a receiver any road which, owing to a strike, fails to operate its line for ten days. As this would be a remedy irrespective of the merits of the case, it seems like unjustifiable confiscation.

The power of a great combination of railroads would not be autocratic. It has often been remarked how the Erie Canal, for example, fixes the maximum rate on grain from Chicago to Atlanta. The lines between these two cities can charge no more than the Erie Canal rate to New York plus the coastwise and rail rate from New York to Atlanta. So our great lakes and rivers will forever limit, directly or indirectly, the tariff charges of our roads. And yet within these limits a combination would be subject to no natural control, and might be merciless. The interests would be so vast which might be subjected to injustice that our people would never consent to a state of things which would render such injustice even possible.

The increase of money circulation in the United States since the resumption of specie payment in 1879 is shown by official documents which have been carefully compiled by the *Financial Chronicle*, of this city, the statistics for 1879 having been made up from the Government reports of that year and those for May 1, 1888, from the Treasury exhibits of that date. The statement thus presented has a special interest, from the fact that erroneous views on this subject are frequently entertained. The better to avoid misleading conclusions nothing but actual money is counted, as no certificates, whether silver or gold, or legal tenders in Government vaults are included. The comparison is as follows:

	In Treasury.	In hands of the people.	Total.
1888..	$325,090,934	$1,371,818,873	$1,696,909,807
1879..	223,704,386	827,716,559	1,051,420,945
Inc.	$101,396,548	$544,102,314	$645,488,862

The foregoing includes no silver or gold certificates nor legal tender certificates in Government vaults; these all, we are reminded, having "no legal existence except when they are out of the Treasury." About these figures there is no ambiguity, and they show conclusively an increase of nearly $650,000,000 in the currency of the country since the resumption.

The Blast Furnaces on June 1st.

The returns of the blast furnaces in blast in the beginning of the current month fail to show any reduction whatever, so far as the make of the stacks using anthracite as a fuel is concerned. With the exception of a few who have repeatedly stated this fact after carefully going over the ground, this will probably be a surprise to the trade at large. The erroneous opinion alluded to has gained ground, probably from the fact that much emphasis has been laid upon the stoppage of work at a few plants, generally small, while resumption of work has caused considerable comment. Below are the details:

Anthracite Furnaces in Blast June 1.

Location of furnaces.	Total number of stacks.	Number of furnaces in blast.	Capacity per week.	Number of furnaces out of blast.	Capacity per week.
New York	29	11	3,096	18	4,868
New Jersey	15	5	1,287	10	3,313
Spiegel	3	2	159	1	63
Pennsylvania:					
Lehigh Valley	48	26	8,661	22	6,097
Spiegel	1	1	50	0	0
Schuylkill Valley	41	21	6,290	20	5,570
L. Susquehan. Val.	24	13	5,818	11	1,840
Lebanon Valley	15	11	4,240	4	3,350
U. Susquehan. Val.	18	9	2,818	9	1,610
Maryland	4	0	0	4	832
Total	198	99	32 418	99	27,543

As compared with former months these figures stand as follows:

	Furnaces in blast.	Capacity per week.
June 1, 1888	99	32,418
May 1	96	31,008
April 1	94	30,496
March 1	98	28,598
February 1	97	29,989
January 1	118	38,206
December 1, 1887	122	39,487
November 1	124	40,028
October 1	123	39,440
September 1	125	38,338
August 1	129	37,930
July 1	138	40,742
June 1	138	44,188
May 1	137	43,802

New York shows a slight gain, because, while one of the Fallkill furnaces blew out, the larger Franklin furnace resumed on the 14th inst. In New Jersey the reverse has taken place, Pequest withdrawing from the active list, while Warren was added to it. In the Schuylkill Valley both Keystone are running and Swede blew in, but Chester, which we group with this section, a large furnace, stopped during May. In the Lehigh Valley the May output, aggregating the figures from all but one small producer, reached 39,241 gross tons, of which, however, about one-third is Bessemer pig. The relatively heavy product has more than compensated for the stoppage of two small stacks. The Lehigh spiegel furnace has again begun operations after extensive repairs and improvements. In the Upper Susquehanna there has been no change, the reports of every furnace in the district giving a total output of 12,479 tons in May, against 11,238 tons in April. In the Lower Susquehanna district the blowing in of four furnaces of the Pennsylvania Steel Company has added quite heavily to the monthly make.

The status of the coke furnaces was as follows:

Bituminous and Coke Furnaces in Blast June 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	3	1	900	2	1,800
Pennsylvania:					
Pittsburgh district.	19	15	14,139	4	3,475
Spiegel	1	1	331	0	0
Shenango Valley	19	11	6,642	8	4,138
Juniata & Conem.	22	12	5,585	10	2,125
Spiegel	1	0	0	1	295
Youghi. Valley	4	3	1,243	1	980
Miscellaneous	3	2	1,132	1	580
Maryland	2	0	0	2	340
Virginia	11	6	3,148	5	2,726
West Virginia	6	3	2,013	3	710
Kentucky	4	4	1,080	0	0
Ohio:					
Mahoning Valley	15	9	6,450	6	4,320
Hanging Rock	14	10	2,130	4	1,692
Hocking Valley	15	5	1,221	10	2,230
Central and Northern.	17	9	6,204	8	6,152
Illinois	15	9	9,885	6	8,385
Missouri	8	3	1,794	5	760
Wisconsin	3	1	600	2	1,370
Indiana	2	1	230	1	220
Michigan	1	0	0	1	200
Alabama	17	13	6 856	4	2,015
Tennessee	10	10	4,360	0	0
Georgia	2	2	760	0	0
Colorado	1	1	490	0	0
Total	215	131	77,238	84	44,553

	No. of furnaces.	Capacity per week.
June 1, 1888	131	77,238
May 1	130	75,815
April 1	128	70,644
March 1	128	68,892
February 1	136	73,912
January 1, 1888	143	83,101
December 1, 1887	144	88,835
November 1	151	90,459
October 1	152	89,123
September 1	145	83,124
August 1	113	62,091
July 1	98	47,319
June 1	98	44,865

It will be observed that there has been a small gain in the capacity at work, which is almost entirely due to the new furnaces of Alabama, the increase in Pittsburgh district being counterbalanced by a falling off in other quarters. In Allegheny County only four stacks are now idle. Of these, Furnace D of the Edgar Thomson plant is being relined and will be ready for blast in about 30 days. Isabella No. 2 is also being repaired and will be ready for blast about July 1. Soho of the Moorhead-McCleane Company, is being rebuilt and enlarged, and will not be ready to commence operations for about four months. Clinton, of Graff, Bennett & Co., is idle, on account of the failure of that firm. It is a very old furnace, having been built in 1859, and it will probably never resume again. Rebecca, of the Kittanning Iron Company, Limited, at Kittanning, Pa., is being relined and rebuilt by McClure & Schuler, of Pittsburgh, and will probably be ready for operations next month. In the Shenango Valley, Fannie resumed work during May, while the second stack of the Sharon Iron Company went out. The only change in the Juniata and Conemaugh Valley district is that Pennsylvania Furnace stopped on the 22d ult., its owners stating that they do not propose to blow again so long as the iron market remains in its present condition. In Virginia Princess resumed on the 8th ult., but the break of a pump caused a week's delay, so that the product was light. Gem went out on the 6th and Lynchburg on the 20th. In West Virginia the exhaustion of the mine from which supplies of ore have been drawn hitherto caused cessation of work at the Irondale. New ore property is being developed, so that the stack will probably

be idle for two months. In Kentucky Licking Furnace is again in blast. In the Mahoning Valley Anna went out on the 17th ult., and May Furnace stopped on the 2d inst. Both are to undergo repairs of lining and bosh, and will be ready to resume on July 15th, provided the outlook is more favorable. In the Hanging Rock region Belfont is out, while among the furnaces grouped under "Central and Northern Ohio" Steubenville has stopped running. In Illinois the second Chicago furnace is now idle. In Missouri, Wisconsin and Indiana no changes are reported. In Alabama the Pioneer and the Bessemer furnaces for the first time swell the ranks of producers, while Sheffield was running on the 1st, and the second Ensley was getting ready to apply the torch. On the other hand, the second Sloss furnace went out for repairs on the 26th ult.

The discussion of the Mills bill in the House of Representatives is progressing very slowly. At the present rate it would take over a year to dispose of the proposed measure should other important items bring out as much debate as the lumber section. The support given to the bill has fluctuated thus far, the interests of particular sections deciding the position of a sufficient number of members to cause considerable differences in the slight majorities secured. Present indications point to a protracted discussion and to numerous and important modifications before the bill passes the House. There seems little chance of its acceptance by the Senate, unless it is again seriously revised in conference committee.

Reductions in Pittsburgh Westbound Freights.—At a meeting of the freight agents of the various railroads having connections with Pittsburgh, held in that city on Saturday afternoon the 2d inst., it was decided to make a considerable reduction on westbound freight rates on iron and steel, on the basis of the recent reduction made on the rates to Chicago. The new rates are given below, the higher figures being for less than carload lots, and the lesser figures for carload lots. They are as follows: Chicago, 18 and 12½ cents; East St. Louis, 18½ and 15 cents; South Bend, 14 and 12 cents; Detroit, 12 and 10 cents; Toledo, 10 and 9 cents; Buffalo, 11 and 8 cents; Oil City, 10 and 7 cents; Grand Rapids, Bay City, Saginaw and Muskegon, each, 15 and 12½ cents; Burlington, 22 and 19 cents; Joliet, 16 and 13½ cents; Milwaukee, 17 and 14½ cents; Cleveland, 8 and 7 cents; Erie, 8 and 7 cents; Cincinnati, 12 and 8 cents; Louisville, 17 and 13 cents. The change went into effect on Monday, the 4th inst.

The copartnership heretofore existing between Martin V. Smith and Alexander Laughlin, under the firm name of Smith & Laughlin, metallurgical engineers, with headquarters in the Bissell Block, Pittsburgh, Pa., has been dissolved by mutual consent. M. V. Smith will continue the business of metallurgical engineering, with office as heretofore, Alex. Laughlin retiring for the purpose of engaging in the business of constructing regenerative gas furnaces and artificial gas producers, under the firm name of Alex. Laughlin & Co., with principal offices in Wade Building, Cleveland, Ohio.

A meeting of the Merchants Steel Association was held in this city on May 30. No changes of importance were made in prices, but a slightly revised classification of steels was adopted.

CORRESPONDENCE.

The Duty on Wire Rods.

NEW YORK, June 5, 1888.

To the Editor of the Iron Age: The rate of duty to be imposed on imported wire rods is of great interest to two classes of American manufacturers—the rod mills and the wire mills. The former, through the Iron and Steel Association, made strenuous efforts last year to have the Treasury Department consider number six gauge rods as wire dutiable at a specific rate, equivalent to over 100 per cent., and as an alternative at the same rate as number five rods—$\frac{6}{10}$ cents per pound—about 55 per cent. In this they failed; the Assistant Secretary preferring to follow the rulings of the Department under the previous administration. As this attempt has twice been a failure, it is not likely to be again repeated, and it may be assumed that the present rate of 45 per cent. will remain in force until changed by legislation.

What alteration, if any, should be made by Congress? The Mills bill leaves the rate unchanged, while the Randall bill increases it to 1 per cent. per pound or substantially to 100 per cent. It may safely be assumed that the latter voices the wishes of the rod-makers, while the wire mills, who are not interested in rod trains, desire a reduction. This difference of opinion is one of great movement—heavy investments have been made in plants for the manufacture of both articles, which give employment to large numbers of workmen, while to a less extent all who use wire in any of its numerous forms, such as barb wire, wire nails, &c., are concerned in whatever will affect the price.

If a correct principle be recognized for adjusting the duty it will not be difficult to fix the rate, as the costs of material and of rolling rods can be readily and closely approximated. Between the extremes of ultra free trade and prohibitive protection this mean should be found. The rollers of rods who have built extensive plants should receive due recognition, but the interests of the wire mills, who do not wish to engage in rod rolling nor be dependent on their competitors (for every rod mill now running is owned and controlled by wire makers) should also receive some consideration. They, also, are American manufacturers and are employers of American labor, and they are also in need of protection; but the protection they need is against the excessive demands of other American manufacturers, and can only be given by a reduction of the duty on rods. If this be not allowed their position is unenviable. They must either buy foreign rods—and pay thereon a duty which enhances the cost to such an extent as to practically debar them from competitive sales—or else they must go to their rivals in business and seek their supply from domestic manufacturers. The latter will endeavor to put the price so high that they can secure the entire profit.

As an instance may be mentioned the case of one of the oldest, if not the oldest, wire mill in the country. It is located within less than 100 miles of the seaboard, while the nearest rod mill, any part of whose production is for sale, is three times as far distant. This mill has been running for many years on foreign rods; it is managed most economically, run by water-power, has cheap fuel and low freights, and possesses the advantage of ample capital. Although not as large as many wire mills, it can give employment to more men than five rod mills require. This mill and others like it cannot, at the present duty on foreign rods, nor with the present price of domestic rods, sell wire except at a constant and considerable loss. Yet an appeal is made, in the name of protection for American labor, in behalf of rod mills which are sellers of wire rods, less than half a dozen in number and employing in the aggregate about 100 men, not only to retain the present rate of duty, but even to increase it. The manufacturer used for illustration is but a type of many more who are placed in a similar position. A moderate reduction in duty will enable them to continue running their mills without absolute loss, and with this they are measurably content.

It seems a fair proposition that the duty shall be such as to give rod mills which have chosen eligible locations, where fuel is cheap and freight to distributing centers low, a liberal return on their investment after allowing for contingencies and the payment of their present rates for labor. This protection they should have, and they are entitled to no more.

It can hardly be contended that the duty shall be put so high that a profit can be made on plants erected without regard to economy of production or facilities for distribution. To do this would be to put a premium on incapacity, and protect the fool against the consequences of his folly. If this much be conceded, we may proceed to a comparison of figures in order to see what assistance should be given to the domestic rod mills, and for this purpose, select the rod mills of Western Pennsylvania. The lowest price at which foreign rods can be imported, exclusive of duty, is now about 120 marks per 1000 kg., or, roughly, $29 per ton (and lest it may be urged that this is an artifically high price, resulting from the action of the German syndicate, it may be said that neither Belgian nor English rods can be bought any lower, and the makers in these latter countries admit their inability to sell the rods at a less rate). The freight from the seaboard to Pittsburgh is $3, making the cost of foreign rods delivered there about $32, exclusive of duty.

As shown by sales within a week, rod mills at Pittsburgh can purchase billets at $28.50 per ton, delivered. These can be rolled into rods at $7 per ton, or a total of $35.50—$3.50 above the cost of the foreign; $5 more is certainly a most liberal allowance for variation in price of billets or reduction in price of foreign rods, and should leave over $3 net profit to the rod mills, or $75,000 per annum on a plant which costs only about $100,000. Even with such a profit as is shown by this estimate there need be but a duty of $8.50. Then a duty of $\frac{8}{10}$ cents per pound, $8.96 cents per ton can only be held to err in the interests of the rod mills. They are not satisfied with such a rate as this. They are not satisfied with the present duty, which is $2 more. They ask and urge that the duty be raised to $17. or even $20 per ton. Their selfishness may overreach itself, and must, if the questions involved are rightly understood. The cost of rolling rods herein given may be overestimated, but no candid man conversant with the exact facts can say that rods are not being rolled at a cost not in excess of the figure named.

In *The Iron Age* of May 10 is an interesting letter, which, from internal evidence and the indication given by the point at which it is dated, is probably written by the man to whom the wire-rod industry owes its perfection to-day. To that communication I shall refer, as he appears as the spokesman of those who desire an increase of duty. He states that $720,000 have been spent in building rod mills alone during the last six years—that during 1887 there has been a large increase in the quantity of rods sold in the open market—that the Joliet Steel Company is now erecting a plant for making rods solely for sale, and that rods in this country are now rolled from a 4-inch billet weighing 135 pounds direct to the rod. Cannot an in-

dustry which has shown such marvelous improvement, whose prosperity is so evident, and whose facilities are so great, stand a little reduction in the duty which has heretofore been in force? Do not these statements by an advocate of a higher duty for rods prove the case against himself?

Your correspondent states that the rod mills, if let alone, can supply the entire domestic demand and do a large exporting business. How can this be done? Not by a reduction in wages paid, for labor is a small proportion of the cost of rods; not by a saving in fuel, for they now have natural gas, which might almost be called free as air; not by improvements in rod trains, they are now almost perfection. Obviously, then, by a reduction in their profits. This need not be delayed; let it begin now. If five years from now no duty would be needed, let that desirable end be reached by graduated steps; let one-fifth of the duty be taken off at once. A duty of $\frac{4}{10}$ cent per pound will amply protect American makers, and a reduction to that rate will prevent the annihilation or absorption of the wire mills by the rod mills.

However much "Rod Mill" may be astray in his conclusions or opinions, he is certainly entitled to the credit of adhering to facts. In this his example might fitly be emulated by Congressman Randall, who, in his recent speech, made statements regarding the wire rod industry so diametrically opposed to the truth that they can proceed only from a willful perversion of facts, either by Mr. Randall himself or his informants.

He states that on a fair valuation 1 cent per pound duty will not exceed 45 per cent. ad valorem. Then a fair valuation must be $49.78 per ton, at European mills, which is double the actual present price, as he could readily have ascertained. He bases this claim, apparently, on a statement from the Treasury Department that iron and steel wire rods of No. 5 and heavier gauges were invoiced, in 1886, at an average of 1¾ cents per pound, while the lighter sizes were invoiced at $1\frac{1}{10}$ cents per pound. The explanation of this is obvious. Norway iron costs more than steel; it cannot be rolled into rods to advantage, and, even if it could, a 45 per cent. duty would be higher on such stock than the specific duty imposed on larger sizes. Hence Norway iron and cast-steel rods are made larger gauge than the cheaper Bessemer-steel rods. Mr. Randall also states: "It is impossible for our manufacturers to make wire rods under the present tariff," and that "there are increasing importations of wire rods." The facts are that there has been a reduction in the importations of 1888, as compared with the same period in 1887, of nearly 50 per cent. He also affirms: "There can be no appreciable increase in the price to the farmer of his wire for fencing, notwithstanding an increase in the duty on wire rods." Wire is now sold for fencing at an advance of $7 per ton over the cost of rods. In view of this the proverbial sharpness of the Philadelphia lawyer must be called into play to explain how $11 per ton extra duty can be paid for rods without enhancing the price of wire. Mr. Randall then states that a duty of 1 cent per pound is not more than sufficient to cover the cost—and this in face of the fact that new rod mills are being built and old ones crowded to their utmost capacity in order to reap the abundant profit which a duty of 45 per cent. allows.

In the same speech a comparison is made between the duty on wire rods and other articles of steel and iron, by which the conclusion is reached that the duty on wire rods is disproportionately low. If this argument is good it is double ended. If the present duty on rods is more than sufficient, then the duty on railway bars may be too high. What useful purpose can be served by such misstatements as have been pointed out? Weak is the cause which must be served by an attempt to foist such falsities on the House of Representatives as a basis for fixing the tariff.

Let this subject be considered in a fair spirit and equity to both rod mills and wire mills dealt out, and, if so approached, the conclusion is inevitable that a reasonable reduction in the rate of duty on rods may be made without affecting any reasonable amount of prosperity to the rod mills, while it will enable the wire mills to continue their operation without constantly impairing their capital for the benefit of an already superfluous revenue, or the avarice of the rod mills.

FAIR PLAY.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 5, 1888.

The progress made on the Tariff bill under the five-minute rule has not been very encouraging to its friends during the past week. The Republican opposition has delayed consideration, but it has not succeeded in modifying any of the features thus far taken up. The question of consideration has become involved in a side issue on establishing special orders. The Democrats wished to designate certain questions for consideration during certain day and night sessions in order to advance legislation. The Republicans object, unless the Arrears of Pension bill is given the precedence on the list. As Chairman Mills and his followers object to this whenever the lines are drawn the Republicans, by refraining from voting, have prevented a quorum, which has thrown the parliamentary machinery out of gear and legislation has stopped. As soon as the St. Louis convention shall have adjourned and the Representatives now in attendance there have returned to their seats in the House the attempt to carry out the special order of programme will be renewed. There being a quorum of Democrats present if they concentrate and act together there will be no difficulty in the way. The course of the Republicans has somewhat exasperated the leaders of the majority and as a measure of retaliation they are now serving notice that they will go right ahead as soon as they get a quorum and will take advantage of the absence of members of the minority at Chicago. This will doubtless lead to filibustering which will still further widen the breach between the two parties.

The eyes of the Administration, the official and Congressional world, and politicians generally, are now centered on St. Louis. There has been a great deal of talk one way and another about the platform. The President from the beginning has asked the indorsement of his message on revenue reduction to Congress. This has met with a favorable response from the great mass of the party in all sections of the country. The indorsement of the Mills bill, although carried in Pennsylvania, was not in accordance with the wishes of the Administration, the position being taken that being subject to modification in the House such action would be embarrassing. No less than 30 amendments have been adopted by the Democratic caucus, and will therefore receive the majority vote when reached. Almost as many more are proposed. A formal resolution of indorsement at St. Louis would cut off any further changes, as that would be regarded as in opposition to the convention.

The Washington Naval Arsenal is the center of eager interest to ordnance officers and engineers. The cast-steel gun sent there from Pittsburgh has been placed in position ready for boring, rifling and polishing. The Chief of Ordnance expects that the gun will be ready for testing before the 1st of September. It is a perfect mass of metal. If it will maintain the same high standard in the matter of practical work as an engine of war, it will mark an event in heavy gun making.

The office of the Secretary of the Treasury presented an animated scene on Monday, on the occasion of the bidding for the furnishing of steel to be used in the construction of the armored cruiser Maine, which will be built under the direction of the Department at the Navy Yard at New York. The following were the bids:

For steel plates:
Carnegie, Phipps & Co., Pittsburgh, $89,779.
Chester Rolling Mill, Chester, Pa., $114,240.
Linden Steel Company, Pittsburgh, $120,422.

For steel shapes:
Carnegie, Phipps & Co., Pittsburgh, $35,986.

For steel rivets:
Carnegie, Phipps & Co., Pittsburgh, $9,737.
Oliver Brothers, Pittsburgh, $10,584.

For steel castings:
Pittsburgh Steel Casting Company, Pittsburgh, Pa., $50,176.
Midvale Steel Company, Nicetown, Pa., $56,448.
Standard Steel Casting Company, Thurlow, Pa., 18 cents per pounds.

Secretary Whitney expressed himself as very much gratified at the interest manifested by steel manufacturers. He also says that since the Government has become a purchaser of high-grade steel the product of American establishments has improved in quality, so that American steel will equal that of any part of the globe.

The cruiser Baltimore, at the Cramp yard, at Philadelphia, will be ready for launching about the middle of July. A small party will be invited to witness the event.

Boycotting Condemned.—Boycotting is emphatically condemned by Judge Pickett, of the city court in New Haven, Conn., who sentenced the secretary of the Brewers' Union to pay a fine of $200 and be imprisoned for six months on the charge of being the chief instigator of the Weibel brewery boycott. Two others implicated went to jail in default of $600 and $300 bonds respectively. Judge Pickett, in giving his opinion, said that the court found them guilty of conspiring by unlawful means to injure and oppress Joseph Weibel and to compel him to discharge his foreman, one Joseph Schneider. In the opinion of the court the agreement between two or more persons and their concurrent action in pursuance for such agreement to hinder and prevent any man from procuring work for his hands to do of such kind and character and for such wages as he is willing to accept, or to force any man to leave such employment against his will and that of his employer, or to compel his employer against his will to discharge him from such employment if the same be lawful, is a conspiracy subversive of individual rights, and a high crime and misdemeanor at common law. And to prevent any person from finding a market for goods lawfully manufactured was a common law offense, similar to the statutory offense of malicious injury to the bridge, dam, flume boards, &c., of another.

In our description last week of the blowing engines built by the Copake Iron Works we should have mentioned the fact that the designs were executed by Mr. R. C. Borchers, of Philadelphia, Pa., who is entitled to a fair share of the credit attached to their successful construction and working.

Mr. John M. Watt, mine inspector of the Eighth Bituminous District, Pennsylvania, has resigned his office, to take effect on the 1st inst.

MANUFACTURING.

Iron and Steel.

The employees of the Pennsylvania Tube Company, at Pittsburgh, have been notified of a 10 per cent. reduction in wages to take effect on Monday, the 11th inst. They will have a meeting during the present week to consider the proposed reduction.

Warren Furnace, at Hackettstown, N. J., started up on Friday morning, the 26th ult., after lying idle for five years.

A frightful boiler explosion took place at the Eureka Iron Works, at Wyandotte, 12 miles below Detroit, last Friday. The whole end of the plate mill disappeared and the 20-ton boiler lay 40 feet distant, torn to pieces. Three men were killed instantly, and the damage to property is estimated at $25,000.

The Catoctin Furnaces, in Maryland, have been sold to a syndicate, but an organization has not yet been effected.

From the Steelton (Pa.) *Reporter* of the 2d inst. we take the following regarding operations at the plant of the Pennsylvania Steel Company, located at that place: "The closing of the month at the works of the Pennsylvania Steel Company shows the production to be the largest for any month of the year. No. 1 Bessemer this week has made more than an average production and No. 2 is fully up to the average. Both furnaces at the open hearth were on special steels up to Wednesday, when No. 2 furnace was taken off for repairs, and will be ready for work early next week. A 7-ton roll was poured with steel this week. No. 1 blooming mill made a heavy product during the week. No. 2 blooming mill also made a large output of nail plates and blooms. The men will go on tonnage next week. The hammers are kept busy —one turn was on cruiser steel and forgings for shipment. The second turn was also on cruiser steel and billets. The rail mill started up on 60s, sec. 6, and changed rolls on Tuesday to 56s, sec. 51, and were still on same order when we closed our report. The machine shop is crowded with work for Sparrow's Point. The carpenters and pattern-makers are also crowded with work which is pushing them. The foundry prepared molds for several heavy castings for Sparrow's Point in addition to the usual ones for home use. A 7-ton roll was poured with steel at the open hearth furnaces. The merchant mill was running rails and billets on the 20-inch train and light rails and general merchant steel on the 13-inch train. The frog, switch and signal department continues pressed with orders and is kept in operation day and night. The shipments during last month were very heavy."

The spiegel furnace of the Lehigh Zinc Company, at Bethlehem, Pa., has been lighted after a year's idleness, and the first cast was made May 28.

No. 2 furnace of the Sloss Iron and Steel Company, at Birmingham, Ala., is in blast. No. 1 furnace of the above company, which is undergoing extensive repairs, will be ready for blast about the 15th inst.

While fixing the bell at the blast furnace of the Stewart Iron Company, Limited, of Sharon, Pa., on May 31 an explosion of the gas which accumulated in the bell occurred. One man was instantly killed and the three others so dangerously burned that it is feared they will not recover. Considerable damage was done to the furnace.

In our issue of the 24th ult. we made mention of the fact that the employees of the National Tube Works Company, of McKeesport, Pa., had been notified of a reduction in wages of from 7½ to 15 per cent., to take effect on the 1st inst. At a meeting of the employees held a few days after the announcement was made it was decided to accept a reduction of 5 per cent. This action was laid before General Manager John H. Flagler, who refused to accept this compromise, but made another proposition to the men to make a reduction of 7½ per cent. on all labor receiving $2 or less per day and 10 per cent. on all labor receiving an amount in excess thereof. This last proposition has been accepted by the workmen, and the works will continue in operation. A great deal of satisfaction has been expressed on all sides, on account of the friendly manner in which the matter has been settled.

The Joliet Steel Company, at Joliet, Ill., were temporarily inconvenienced by a strike of a few men working at their blast furnaces. When the night turn on Sunday, May 27th, came on, the top fillers called for additional assistance; the night foreman was unable to procure men without proper notice and urged the men not to take any rash step until he could communicate with the superintendent. They, however, stopped work without any warning. We understand that when these furnaces were put in blast last March, a contract was entered into and signed by the men, covering the number of men to be employed in each department and the wages to be paid, it being agreed between the men and the management that if the furnaces made any extra output or when the weather was excessively hot they should be given additional assistance. Neither of these contingencies had occurred when the men made the demands referred to and it was a direct violation of the contract on their part. Owing to the condition in which the furnaces were left the management conceded the point demanded and work was resumed after about 36 hours' stoppage.

Mr. Willard Warner, president of the Nashville Iron, Steel and Charcoal Company, of West Nashville, Tenn., informs us that No. 2 furnace, recently blown in charcoal, is making 50 tons of iron per day. On the 30th ult. the furnace made 52 tons of No. 1 and No. 2 foundry on 90 bushels of coal of 20 pounds to the bushel, with washed brown hematite ore yielding, raw, 50 per cent. of iron. The heat developed by the Gordon stoves is 1400 degrees. Mr. Warner since informs us, under date of June 1, that on the 31st ult. the furnace made 57¾ tons, an excellent record.

The Sharon Steel Casting Company, of Sharon, Pa., have one of the most complete and best equipped plants in the country for their particular class of product. At present they are very busy on knuckles for vertical plane car couplers, and are also making the Fowler steel car-wheel. The business of the company is constantly increasing and at present they are employing about 200 men. They have facilities for producing castings of from 1 pound up to 15 tons.

No. 1 furnace of the Glendon Iron Company, at Easton, Pa., is out of blast, undergoing repairs. Unless a decided improvement takes place in the demand and selling price of pig iron, the furnace will not resume operations when the repairs are completed.

The Muncie Forge and Iron Company have been incorporated at Muncie, Ind., with a paid-up capital stock of $50,000. Messrs. John H. Carter, Lewis K. Torbett, Albert R. Corre and Charles T. Dickson, all of Cincinnati, are interested in the company.

The employees of the tube department of the Reading Iron Works, of Reading, Pa., in whose wages a reduction of 10 per cent. has been ordered, have not as yet determined whether they will accept the reduction or not. A conference will be held between the firm and the employees during the present week, when it is expected the matter will be satisfactorily arranged.

The trustees of the Bridgewater Iron Company, of Bridgewater, Mass., have declared another dividend of 10 per cent., making 40 per cent. which has been paid toward the indebtedness of the company.

The long strike of the puddlers at the works of the Hollidaysburg Iron and Nail Company, Limited, and McLanahan, Smith & Co., Limited, at Hollidaysburg, Pa., has resulted in a victory for the firms. The strike was officially declared off on Saturday, the 26th ult., by the Knights of Labor at that place. The puddlers demanded $4 per ton and the Philadelphia scale, but have agreed to accept the companies' offer of $3.75 per ton and the Harrisburgh scale. The strike was in continuation for two months and affected 700 men. Both plants are now in full operation with the old employees.

Swedes Furnace, at Swedeland, Pa., was put in operation on Monday, the 4th inst., giving employment to about 60 men. The furnace was closed down in August of last year on account of the stoves totally collapsing and rendering complete remodeling necessary. About $50,000 has been spent on the improvements, and the capacity has been increased to 75 tons per day, the former limit being about 45 tons.

The puddlers, employed at the Pottsgrove Iron Works of the Potts Brothers Iron Company, Limited, at Pottstown, Pa., have received notice of a reduction in wages which will bring the rate down to $3.25 per ton for puddling. Other labor in the puddling department will be reduced accordingly.

The Standard Foundry Mfg. Company, of Cleveland, Ohio, closed contracts last week for the rebuilding of their works which were destroyed by fire some time ago.

Among recent important changes in the position of the blast furnaces may be noted the blowing-out of the following stacks: Mount Laurel, Clymer Iron Company, Temple, Pa., June 10, for repairs; White Rock, Lobdell Car-Wheel Company, Wilmington, Del., to put in a new hearth; Pennsylvania, Center Mining Company, Limited, Penn Furnace, May 22, awaiting satisfactory condition of iron market; Chatham (N. Y.), June 1, owing to depressed trade; Franklin, Franklin Iron Works P. O., N. Y., May 14; Isabella, Barneston, Pa., May 26, on account of exhaustion of stock; No. 2 stack Sloss Iron and Steel Company, Birmingham, Ala., 26 ult., for repairs; Anna and Mary, Ohio Iron and Steel Company, Lowellville, Ohio, May 17 and June 2, respectively, both undergoing repairs to lining and bosh, and to resume July 15 if business outlook is favorable.

It is reported that Pulaski Furnace, at Pulaski, Va., has chilled.

The stack of the Tecumseh (Ala.) Iron Company was blown in on the 2d inst. The furnace has been put in thorough repair by the addition of a new hearth, inwall, counter-wall and bottom, and the bosh has been increased to 13 feet.

Irondale Furnace, Independence, W. Va., blew out on May 16, owing to scarcity of stock, the ore mine from which it drew its supply having been exhausted. A new mine is being developed, and blast will probably be resumed about July 15.

The Blandon Iron Company, which operates an extensive rolling mill at Blandon, near Reading, posted the following notice yesterday morning: "At

the present time the cost of manufacturing exceeds the selling price of our products. We have therefore decided to close down the mill to-night for an indefinite period."

The puddlers' strike at Bellefonte, Pa., which has been on for several weeks past, is at an end. The agreement made between the employers and employees is, that they shall hereafter be regulated by no other scale of wages but their own, and the promise is made to pay the men at all times the highest rate paid East of the Alleghenies. The puddlers for the present will receive $3.75 a ton, at which price they refused to work several weeks ago.

The men employed at the Sheldon Axle Works, at Wilkesbarre, Pa., who were notified of a reduction in wages, struck work and a portion of the works are idle in consequence.

Machinery.

Among recently authorized corporations in Illinois is the Ohio Feed-Water Heater and Purifier Company, at Chicago; capital, $100,000. Incorporators, George B. Stoddard, Robert G. Galder and Fred. Gardner.

The Clipper Mowing Machine Company, of South Keene, N. H., have recently received orders for 75 mowing machines for shipment abroad.

Ross' foundry, in Buffalo, for the manufacture of wood-working machinery, was burnt 26th ult.; loss, $20,000, of which about one-half is on patterns.

The St. Louis Steam and Pneumatic Engine Mfg. Company have filed articles of incorporation, with a capital stock of $50,000.

The Palmyra Mfg. Company, of Palmyra, Wis., have completed their new locomotive, designed for use as a street-car motor. It is built under the patents of T. T. Prosser, and is intended to be wholly smokeless and noiseless, although steam is the propelling power. Very favorable reports are published concerning its experimental performances.

The Laper Sleeve Pulley Works Company, of Erie, Pa., with a capital stock of $100,000, were chartered on the 28th ult. E. C. Gray, of the above-named place, is the principal stockholder.

The new machine shops of Smith, Myers & Schnier, of Cincinnati, Ohio, will be equipped with the most improved tools and machinery, and when completed will make one of the finest plants in the country. The new portion of the works will be in operation by July 1st.

The Link Belt Machinery Company, of Chicago, have purchased 5½ acres on Thirty-ninth street, at the Fort Wayne Railroad crossing. On this tract they propose to erect a foundry for the production of machine castings, pulleys and gearing, their Jefferson street property being required for machinery purposes.

An inventory of the assets of the Smith, Beggs & Ranken Machine Company, of St. Louis, was filed in Judge Barclay's court last week by Wm. H. Thompson, assignee. The value set on the property, outside of real estate, is $50,410.13. Henry Stanley and James Miller were appointed appraisers.

The Westinghouse Electric Company, of Pittsburgh, report the building of a large number of new plants, and also state that the business for the central station opens much earlier than in any previous season, contracts being usually deferred until late in the season, when the days become shorter. The demand for light and power has necessitated the building of plants in the following places: Palmer, Mass.; Pittston, Pa.; Passaic, N. J.; Little Rock, Ark.; Oakland and San Bernardino, Cal.; Newark and Salem, Ohio; Hagerstown, Md.; Troy, N. Y.; Conshohockton, Pa.; also an order for lighting the Baldwin Hotel and Theater, San Francisco, making altogether a total of 12,000 lights.

Davies & Thomas, machinists and founders, at Catasauqua, Pa., are very busy at present. They have orders for Lowe gas apparatus for Kansas City, Mo., Binghamton, N. Y., Atlantic City, N. Y., and Dover, N. H., besides a large contract for castings for McKee, Fuller & Co.'s Car Works, Fullerton. They are busy in the machine shop manufacturing two large upright engines for Braddock and Allentown and an immense patent brick machine for the Lehigh Fire Brick Company, of Catasauqua, Pa.

The Brush Electric Light Company, of Cleveland, Ohio, will erect an electric light plant at Bartow, Fla.

The Pratt & Whitney Company, of Hartford, Conn., write us as follows under date of June 4: "It may be of interest to your readers to know that the late fire in the establishment of C. A. Delamater & Co., foot of West Thirteenth street, New York, has seriously interfered with their work and made it very inconvenient for them to continue the manufacture of the double spiral lip punches and punching machines, patented by D. L. Kennedy, New York, and thatupon their suggestion the Pratt & Whitney Company have bought out the business and will hereafter make the punches as sole manufacturers under an arrangement with the patentee. A goodly assortment of tools is now ready for delivery, not having been damaged by the fire, and such as are not in stock and special styles can very soon be made by the latter company."

The Curtis Regulator Company, of Boston, Mass., announce the following recent orders: One 3-inch pump regulator for Baltimore, 12 regulators for the Pullman Car Company, 5 for the American Steam Gauge Company, 63 water pressure regulators and 6 locomotive regulators for Chicago, 2 pump regulators for the Davidson Pump Company and 1 for the Whittier Machine Company.

Hardware.

Under date of the 26th ult. the Girard Wrench Mfg. Company, Limited, of Girard, Pa., write us as follows: "We regret to inform you that our works and contents were totally destroyed by fire on the night of the 23d inst. The loss is about $50,000, on which we had insurance amounting to $17,500. The fire-proof warehouses, which contained the most of our finished product, were saved, and we shall be able to fill all orders for some time. Although the loss is quite large over insurance the company have ample means and will rebuild as soon as possible. It is a great loss to this place, as 85 men were constantly employed."

The Acme Shear Company, Bridgeport, Conn., manufacturers of Shears and Hardware specialties, report that business has been satisfactory for the past few months. They have, however, facilities for the manufacture of other goods, and are desirous of adding to their line some good article of general use, for the advantageous production of which their facilities afford excellent opportunities.

R. H. Brown & Co., New Haven, Conn., are erecting an addition to their drop forging building, which when completed will give them a floor space of 40 x 130 feet. They are also making an addition to their main building, three stories high, 40 x 95 feet. They report that they are very busy on machines and hand instruments for attaching buttons to shoes and garments, and are also behind orders on drop forgings. They are about to put on the market a new yacht cannon, which possesses special features.

Miscellaneous.

Lake shipments of iron ore for the week, closing with Tuesday, the 23d, aggregated 106,339 gross tons, of which quantity 73,463 tons went from Escanaba, 13,683 tons from Marquette, 2918 tons from St. Ignace and 16,575 from Ashland. This makes a total for the season to that date of 215,012 tons. The shipments at the corresponding date last spring had reached 386,740 tons. —*Marquette (Mich.) Mining Journal.*

Among recently authorized corporations in the State of Illinois are the following: The National Wire Mat Company, at Chicago; capital, $300,000; incorporators, Lewis M. Miller, William E. Paddock and Julien E. Buckbee. The Wilcox Split Bolt and Nut Retainer Company; capital, $300,000; incorporators, Oswell A. Bogue, John F. Wilcox and Jonah Cromwell. The Arkansas Manganese Company, Chicago; capital, $1,000,000; to mine manganese and other minerals; incorporators, Jay V. Northam, R. J. Hayes and E. V. B. Hoes. The Chicago Manganese Company, capital, $1,000,000; to mine for iron and other minerals; incorporators, John B. Weimer, Richard J. Hayes and W. L. Mann.

The Davis Platform Binder Company, with a capital of $500,000, have been organized in Cleveland, and are about to establish extensive works for the manufacture of steel platform grain binders. The incorporators are A. H. Johnson, president Arkansas Midland Railroad; John S. Davis, recently of Toledo, an inventor and manufacturer for 30 years of harvesting machinery; A. E. Sumner, recently secretary to the president of the Lake Shore road; L. C. Higgins, purchasing agent of the Lake Shore road; and C. E. Sumner, senior member of Sumner Bros., wholesale jewelers. The enterprise was begun by the first three gentlemen, under a copartnership, last fall. Ten acres of land were secured on the Lake Shore road, at the junction of Lorain street, and extensive works established. As matters progressed, however, the prospect for a large demand was so flattering that they concluded to incorporate, enlist outside capital, and start in on a larger basis. A majority of the stock has already been pledged, and the remainder will probably be placed within a few weeks.

The Cincinnati Corrugating Company, of Cincinnati, Ohio, report an active business in their corrugated steel arches for buildings.

The Chignecto Ship Railway.—Benjamin Baker, one of England's most celebrated mechanical engineers, is spending a few days in Pittsburgh, with Col. James Andrews, the chief engineer of the Tehuantepec Ship Railway Company. In a talk with a reporter Mr. Baker said: "My visit to America was to submit the plans for a ship railway across the Isthmus of Chignecto, in Nova Scotia, to the Minister of Public Works of Canada. The work on this railway will likely be commenced in the coming month of July and will be finished, it is expected, within two years' time. The total outlay will be $5,000,000, all of which has been already subscribed, the Canadian Government guaranteeing in return an annual dividend of $170,000. The railway will be 17 miles long, and, owing to the heavy tide in the Bay of Fundy, which rises at times as high as 70 feet, ships will have to be raised 42 feet by hydraulic pressure. The largest vessel that we will be able to take across will be 2500 tons burden. This Canadian road will be of much benefit to the marine traffic between the Gulf of St. Lawrence and American ports. It will save a distance of 600 miles of ocean travel." Mr. Baker is now engaged in constructing a bridge across the Firth of Forth, in Scotland.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	220.5
Picul	134.

BRAZIL.

PARA, May 31, 1888.—*India Rubber.*—It is generally expected that the receipts at this point in June and July will be very much smaller than they were this month and in April.—*Per cable direct.*

CHILI.

VALPARAISO, March 27, 1888.—*Copper.*—Since our last report of March 17 all Copper that can be rendered available till June 1 has been disposed of on forward delivery, and beyond that producers do not feel warranted to sell in view of the scarcity of workmen and Coal. Total sales during the ten days amounted to 13,327 quintals at $30.30 @ $30.95, $30.50 with 26¼d. exchange, and 27/6 freight equaling £77. 8/6. *Nitrate.*—Ships' room being scarce and freights high, but little has transpired on the spot, but a large trade has been done in futures, distant ones in particular, total sales summing up 788,000 quintals at $2.55 @ $2.70, $2.60 equaling 8/2¾ ℔ cwt. No charters were made for the United States, but 14,000 tons for Europe. *Coal.*—The falling off in domestic production has led to an extensive speculative movement in foreign. As to the date of sailing the following ranges have been paid "to arrive": Newcastle West Hartley, 38/ @ 45/; Orrell, 38/ @ 40/; Australian, 34/ @ 38/, and smelting Coal, 35/ @ 40/. *Exchange*—Has varied but little, and 90 days' sight, may be quoted 26d. @ 26¼d.—*Weber & Co.*

EAST INDIES.

MANILA, May 28, 1888.—*Hemp.*—Our market has remained quiet at $8.37½ ℔ picul, against $7.62½ last year, equaling £28. 5/ and £26. 10/10 respectively, cost and freight; there were cleared for the United States 6000 bales, as compared with 1000 in 1887, and since January 1, 76,000, against 91,000; there are loading for the same destination 15,000, against 23,000, and there cleared for England since January 1, 134,000, against 83,000, while there are still loading for ditto, 8000, against 2000, and the clearances for all other ports amount to 34,000 bales, against 14,000. Receipts at all ports since last cable 22,000, against 12,000, and since January 1, 249,000, against 188,000 last year, and 185,000 in 1886. Freight, $5.50, against $5. *Exchange*, six months' sight, 3/5, against 3/6.—*Ker & Co. per cable direct to Chas. Nordhaus.*

PENANG, April 18, 1888.—*Tin.*—The receipts during the fortnight did not exceed 6000 piculs, while Europeans took 5100, and Chinese, 2800. Opening at $52.20, prices advanced to $52.60, but subsequently dropped to $52, closing at $52.20. There is little demand for Europe, receipts are light, and below the average.—*Schmidt, Kustermann & Co.*

COLOMBO, April 19, 1888.—*Plumbago.*—Our market has been firm at ensuing quotations, in rupees ℔ ton: Large Lumps, 150 @ 160; Ordinary ditto, 115 @ 147.50; Chips, 80 @ 91.25, and Dust, 37.50 @ 60. Since October 1 there have been shipped to the United States, 84,191 cwt.; to Marseilles, 38; to Trieste, 201; to Hamburg, 6266; to Antwerp, 2542; to Bremen, 206; to India, 82, and to England, 50,204—together, 143,730 cwt., as compared with 125,547 last year; 106,944 in 1886, and 103,926 in 1885. *Coir Yarn* has been selling at 7 to 12 rupees ℔ cwt. for Nos. 1 to 4. *Exchange*, six months' sight, 1/4⅝.—*Volkart Brothers.*

SINGAPORE, April 24, 1888.—*Tin.*—Since our last report of the 10th inst. the market has kept fairly steady, owing to supplies being small, but the tendency is all in favor of lower prices. We close with sellers at $52.75. *Tonnage.*—Steamer rates to London are quoted 30/ for weight, and the same to New York direct. For Boston the berth is vacant. *Exchange* is steady at 3/1¼ for six months' sight credits.—*Gilfillan, Wood & Co.*

SOUTH AFRICA.

NATAL, April 15, 1888.—*Gold.*—Official returns just published show that the exportation Gold, obtained chiefly from the Transvaal quartz mines, has been greater even in 1887 than had been anticipated. A share capital of £6,000,000 is at present invested in the Transvaal mines alone, chiefly in the Dekaap Valley, Witwatersrand, Komatie and Malmani Gold producing districts. The increase of Gold exportation during the past three years has been as follows: In 1885, 14,921 ounces were shipped from Natal, worth £52,222, and 5050 via the Cape, worth £17,321—together 19,971 ounces, worth £69,543; in 1886, 31,435 ounces from Natal, worth £113,166, and 6074 ounces, worth £23,914 via the Cape—together 38,109 ounces, worth £137,080; last year 88,793 ounces, worth £308,939 via Natal, and 37,422 ounces, worfh £134,171 via the Cape—together 124,215 ounces, worth £443,110. *Diamonds.*—Diamond exportation from the Cape also shows a notable increase, having been 3,599,036 carats, worth £4,251,837 last year, against 3,135,432 carats, worth £3,507,210, in 1886, and 2,440,788 carats, worth £2,492,755, in 1885. The average price per carat was 23/7½ last year, against 22/4 in 1886.—*Natal Gazette.*

SPAIN.

BILBAO, May 19, 1888.—*Iron Ore.*—Our market has remained firmly sustained at 6/10 @ 7/3 for Rubios and 7/6 @ 8/ for Campanil, both being in request, and several cargoes of each having been sold. More would have been done, but owners of mines are not very anxious to go on selling at above quotations. On the other hand, exportation has fallen off considerably; there are now 28 vessels in port, and of these only 18 will leave with Iron Ore. Since January 1, 1,481,791 tons have been shipped, as compared with 1,742,454 tons during the corresponding period of last year. *Pig Iron.*—During the week 2525 tons have been exported and 898 shipped coastwise. The Vizcaya Company quote Nos. 1 to 3 Pig 60 pesetas or francs ℔ ton, f.o.b. here, and Nos. 4 to 7 57 for single lots, while Nos. 1 to 3 for delivery during the rest of the year are quoted 58, and Nos. 4 to 6 55; Lingotillo, delivered at Huelva or Seville, the company quote 65.—*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, May 26, 1888.—*Iron.*—The Rhenish-Westphalian markets have been quiet, but there is no essential change. Iron Ore remains scarce and high, upholding Pig. No sales to speak of have been made of Spiegel, which is steady at 58 marks, 10 @ 12 %. A good demand has prevailed for Forge Pig at 50 @ 51 marks, all the way to October 1. Foundry is also firm at 51 @ 58, Nos. 1 to 3. Thomas has been in lively request at 45 @ 46. Bessemer has been dull, both domestic and English, at 42/6 ℔ ton, f.o.b. on the West Coast. Luxembourg Forge is looking up, commanding 38.70 marks. With the advent of fine weather, it is hoped finished Iron may show more vitality, both for home use and export. A few engagements extend to July 1. Hoop Iron remains sustained and so do Boiler Plates, which continue wanted. Thin Sheets are neglected and will remain so till the syndicate shall have been formed. Hardly anything transpires in the Wire branch. Neither foundries nor machine shops have any cause for complaint; the car-makers also booked some fresh orders. Railroad material is moderately active and unaltered. The quotation for Billets is 135; for Wire Rods, 120 @ 121; and for Wire Nails, 165. Pig Iron production in Germany, including Luxembourg, in April, has been 349,880 tons, against 314,621 last year. The production of Forge Pig and Spiegel, comprised in the April output, was 180,615 tons; Bessemer, 28,094; Thomas, 98,293; and Foundry, 42,878. During the first four months 1,395,455 tons were produced, as compared with 1,200,439 last year. *Metals.*—In Silesia the advance in Spelter last year from 12.50 marks in July to 20.50 in December caused consumption to fall off, notably that of Sheet Zinc and Zinc White, so that since February last there has been more or less stagnation in the demand, and production has had to be curtailed, prices meanwhile declining. George von Giesche is about to erect a rolling mill for Sheet Zinc in Silesia. Both Spelter and Lead close weaker in our own market.—*Borsenhalle.*

TURKEY.

CONSTANTINOPLE, May 22, 1888.—*Lead.*—The share capital of the Société Minière de l'Empire Ottoman, founded quite recently by M. Hector Battazzi, has been provisionally fixed at £500,000 Turkish, with option to raise the same to £2,000,000. He purchased, since the formation of the company, of the Turkish Government eight Lead mines, seven of which are argentiferous, and five Copper mines, nearly all situated in Asia Minor. The latest machinery and most approved processes are to be introduced for working those mines, &c., and the shares not to be offered for sale in the open market till satisfactory results can be shown.—*Pera News.*

The Cooke Locomotive and Machine Company, of Paterson, N. J., are about to put on the market a new high-speed automatic engine under patents of Mr. James T. Halsey. The engine, we understand, will be built in all sizes suited to electric systems, and will be in all respects a high-class piece of machinery.

Domestic Pig-Iron Competition.

The following communication "from a prominent iron manufacturer, on the decline of iron making in the Lehigh Valley," was addressed to the editor of the Philadelphia *Ledger*, and we reprint the letter herewith:

For a number of years past the iron-producing industries of the Lehigh region have been sensible of a slow and sure decline in their business, which is attributable to various causes: First, the great development of Virginia and West Virginia after the war brought a new and rich country into competition with them; after that Tennessee and Georgia appear on the roll of iron-making States, and finally Alabama ends the line—which stretches from north to south—of States which produce iron and who enter the general markets of the country as competitors, and, as such, regulate the selling price of iron. If we look at the cost of producing iron we find that in Alabama it can be produced for less than $10 a ton; in Tennessee, Virginia and other Southern States, for possibly a dollar or so more, and when we get to the Lehigh region we find that in many cases the cost is more than $16 a ton, which is as much as forge iron can be sold at to-day. The problem, therefore, which the iron masters have to solve is "how to make their iron cost less," and in this they meet with difficulties at once. In the first place, their properties have cost more, their taxes are higher, their schedules of wages are higher than those of the South, and these items of cost are very difficult to reduce, especially that of labor, as the workingmen think their wages are low enough now. Fuel, the cost of which is a large component of the cost of a ton of pig iron (nearly two-thirds of it), is about as low as it can be gotten. Ore can be cheapened by mine-owners taking less royalty and the railroads carrying it for less money. As a matter of fact, the railroads hold the iron-makers in the hollow of their hands, and appeals to them for assistance are generally in vain. Fully one-quarter of the cost of a ton of pig iron at market is represented by freight paid to the carrying companies on the materials used in making it and the transportation of the finished article; and, moreover, the rates of freight on many of these materials are inordinately high, the railroads taking advantage of short hauls to make the rates arbitrarily. According to the annual report of the Pennsylvania Railroad Company, which is very frank in publishing the details of their carrying business, it cost to transport 1 ton of freight on the main line and branches $\frac{42}{110}$ cents a mile, leaving them $\frac{25}{100}$ cents profit, which was certainly not bad, and yet the component parts of a ton of Lehigh Valley pig iron are expected to stand rates three or four times as high, which does certainly not seem reasonable. In view of these facts we would suppose that the railroads would make some effort to foster an industry which is of so much importance to such a large community, and upon which the welfare of such an army of workers depends by reducing their rates a little, but up to the present time there is no sign of any railroad manager having the perspicacity to start a movement in that direction. To the average business man it would seem to be a true proposition that it is better to do a large business at a moderate profit than to do none at all, which latter condition will soon be arrived at in the Lehigh Valley unless some strong measures are taken to prevent it. As a prominent manufacturer remarked: "Between the tariff-tinkers and the railroads, it is only a question whether our heads are chopped off at once or whether we are to be bled to death." IRON.

The D. & H. Toaster.

The accompanying illustration represents a new toaster which has just been put on the market by Dennison & Hamilton, 144 and 146 Lake street, Chicago. It consists

The D. & H. Toaster.

of a wire rack or frame, to which is attached a perforated piece of sheet steel. When in position for use the steel plate is placed in contact with the flame, and the bread is laid on the wire framework. The flame is spread by the steel plate, and thoroughly dries the bread and then evenly browns it without its coming in direct contact with the fire. The toaster can be used over any kind of fire, but is specially adapted for gas, gasoline or oil, and is claimed to be thus far the only satisfactory device for such use.

Boiler and Bail Former.

The accompanying engraving represents a boiler and bail former supplied by F. Felinger, Dunkirk, N. Y. As shown in the engraving, an elastic band is a leading feature of the machine. This is made of steel carefully tempered in oil, and by

Boiler and Bail Former.

the construction of the device is accurately adjustable to various sizes, without adding to or taking from. The maker alludes to this fact as being important, since it saves the necessity of making boilers to fit the former, as is the case with other devices for similar purposes. Bucket bails can be formed of heavy wire with ease and rapidity on this device. The cut represents the device as formerly made, but the maker directs attention to the fact that the nut shown in the center is at present finished with wings, so as to make it readily adjustable with the fingers, instead of being of a form to require a wrench in each case.

New Measures.

The Union Indurated Fibre Company, 37 Barclay street, New York, and 39 Wabash avenue, Chicago, are about putting on the market a line of dry and liquid measures, their most recent addition to the

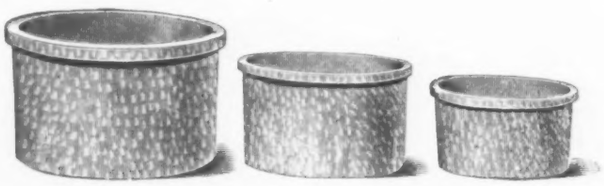


Fig. 1.—Dry Measures.

varied assortment of indurated fibre ware which they are making. Fig. 1 represents the dry measures and Fig. 2 the liquid measures. Of the dry measures three sizes—half bushel, peck and half peck—are manufactured. They are shipped nested and crated four nests in a crate, or each size separate half dozen in a crate. These measures are seamless and have no hoops, the top being strengthened with a rim, as indicated in the cuts. The points made in regard to them are: That they are light, durable and impervious to liquids, never becoming foul or absorbing odors; are cleanly in appearance and easily kept clean. The company allude to the importance of the merchants having measures that are neat and attractive in appearance, alluding to the wooden measure as soon losing its new fresh look, thus contrasting with the wearing qualities of these goods. The liquid measures, shown in Fig. 2, are sold in sets—pint, quart and 2-quart and funnel—or they are crated each size separate, half a dozen in a crate. The company refer to the advantages possessed by these measures over others in use, and suggest that they can be obtained by the trade through the jobbers, or directly. Their adaptation for vinegar, kerosene, molasses and other liquids is referred to. It is stated that all of these measures are sealed

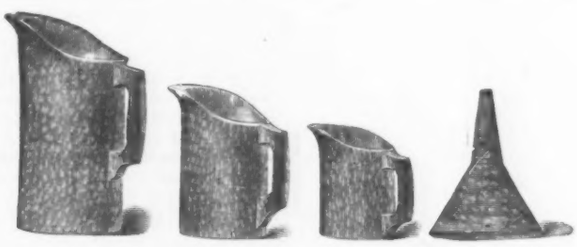


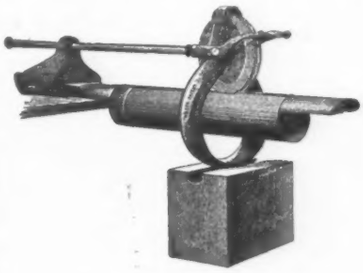
Fig. 2.—Liquid Measures.

before leaving the factory, by a sealer duly authorized by law. It is expected that these goods will meet with a brisk demand from the hardware trade.

It is of some interest to note that torpedo experiments with the old English iron-clad, the "Resistance," to which we referred at the time, have been supplemented by recent additional trials, the main object of the recent experiments, which were conducted on May 15 at Portsmouth, England, being to test the wooden defense booms, which are now used in the British Navy. From the particulars of the trials it appears that with a charge of 93 pounds of gun-cotton exploded under the booms, which were 30 feet from the ship's side, one of the booms was completely shattered, the other one having become disconnected, and therefore not being properly tested. Experiments with steel booms have shown that these simply bend under a much more severe test, and the latter trials would therefore seem to indicate their superiority.

Stove-Pipe Groover.

Wilcox Brothers, No. 212 Lake street, Chicago, Ill., are putting upon the market a stove-pipe groover of a construction that will command the attention of many of our readers. It is illustrated in the accompanying engraving. From the cut it will be noticed that the device is attached to the ordinary hollow mandrel used in tin shops. The grooving-wheel is made of larger size than is usual upon ordinary groovers and the pressure to secure a close

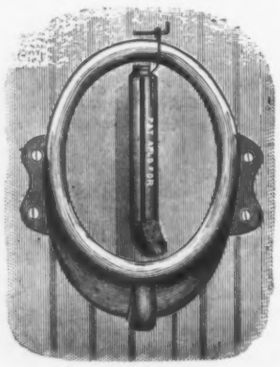


New Stove Pipe Groover.

seam is obtained by means of the weight swung to the lower part of the machine, as shown in the cut. The wheel is cast iron, with shallow grooves. The three most important points, in the estimation of the manufacturers, are easy action, absence of noise and the large amount of work that can be accomplished. The statement is made that a strong boy with little experience can groove 400 pounds of pipe in an hour, and produce better results than an experienced man using the old-style method. The seam to be set down is placed on the mandrel and the carriage drawn quickly to the end. The spring on the guide-bar draws the carriage into position for the next seam. The machine is not restricted to stove-pipe; it may also be used in large tin and galvanized iron conductors and other similar work.

Automatic Disinfectors.

A disinfecting fluid called chloro-naptholeum, a preparation designed for meeting the requirements of, and possessing thorough effectiveness as an antiseptic and disinfectant, and agreeable as regards smell and cheapness, is being put upon the market by Robert S. West, corner of Elm and Winslow streets, Cleveland, Ohio. From a circular before us we learn that this preparation is already largely used in England, and, from the experience that has been had with it, is regarded as one of the most thoroughly effective disinfectants in the world. A number of very strong testimonials from those who have used the material abroad are presented in the circular



Automatic Disinfectors.—Fig. 1.—Automatic Disinfectors Applied to a Urinal.

before us. It is claimed to entirely prevent decomposition or putrefaction by killing the germs or organisms that carry on putrefactive changes. It is also claimed to destroy disease germs or contagion, and is a great safeguard. Its power as a germ destroyer is said to exceed that of carbolic acid and other similar antiseptics that are soluble in water. It does not dissolve in water, but mixes with it, forming an emulsion like milk. In this the chloronaptholeum exists in the form of minute globules, each of which, it is claimed, is undiluted and retains the full power of the compound. In contact with the atmosphere it slowly decomposes, yielding ozone.

Fig. 2.—Automatic Disinfector for Kitchen Sink.

It is claimed to be perfectly harmless and can be used freely. For the purpose of making use of this material a number of automatic disinfectors have been invented for which patents are at the present time pending. We illustrate three of them in this connection. The first represents the disinfector for urinal bowls. It consists of a tube hanging so that the fluid drips to the center and into the drain and thus runs into the sewer. The construction of the tube in this case, as well as in the illustrations following, is very simple. A wick at the lower part is used to draw out the fluid from the tube and is so placed that it allows only enough at a time to thoroughly disinfect the place

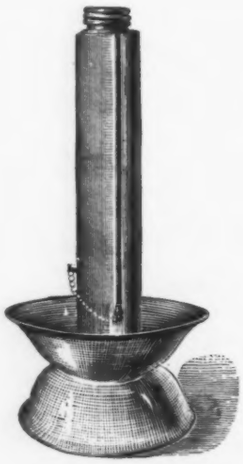


Fig. 3.—Automatic Disinfector for Sick Rooms.

for which it is intended. The second cut shows the form of disinfector designed for kitchen sinks. It is so constructed that the drippings of the fluid can be stopped at any time, so that when any necessary work is being done at the sink the disinfector can be put aside, so as to keep it clean and preventing it from soiling the shelf or table where it may be placed. The purpose of the article is to set it over the drain of the sink and let the fluid slowly drip, thereby killing the poisonous germs and odors which occasionally escape through the best of traps. The third engraving represents the form of disinfector for sick rooms and for other places where it is necessary to destroy any poisonous germs that may be in the air, or to sweeten the atmosphere. It is so constructed that the chloro-naptholeum slowly drips into the water that is placed in the bowl at the base. The supply can be stopped at any time by inserting the plug in the end of the tube through which the wick passes. We understand that there are some other forms of disinfectors prepared for using the material as above described.

The British Government is about to plant a new colony in Africa. The exact limits of the territory are not fixed, but it extends, roughly speaking, from the territory of the German East Africa Company northward to the Somati country and westward to the Albert Nyanzi. A year ago Germany and England made an agreement dividing up the whole country back of the Zanzibar coast. A company called the British East African Company has now been formed to take charge of the British half, and is empowered to levy customs and taxes, to maintain an armed force and to assert authority. The movement is opposed by leading journals, who say that enormous powers over an unknown region, to which England has no right whatever, are to be given to a company of which nothing is known. It is also said that the inhabitants of the territory, numbering 12,000,000 about the lakes alone, may have their own views on the advisability of annexation. The Sultan of Zanzibar has consented, however, and the annexation is nearly a consummated fact.

Ventilated Sad Iron Heater.

The accompanying engraving represents a form of sad iron heater which is being put upon the market by W. C. North, of Cleveland, Ohio. In the circular which the manufacturer has issued the statement is made that after weeks of experiment he ascertained the proper vent to give a sad iron heater in order to secure the greatest amount of heat for the iron. He adds that the current of heated air passing through the heater is held in check and the surplus heat conducted by the hood to the points of the sad iron, thereby heating them thoroughly. Small irons are heated evenly without the points coming in contact with the surplus heat. The device is a square pyramid in shape, with the lower corners cut off, the whole being set in a base plate that corresponds to the opening of the stove. This base plate is so arranged as to afford a flange to support the bottom of the sad iron. The ventilator at the top forms the hood for the reception of the points of the sad iron, while a hollow knob furnishes the handle by which the heater may be lifted on and off the stove. It is adapted for use on various kinds of stoves. In the directions contained in the manufacturer's circular we note the following: On a vapor stove use a full flame, and on a single generator stove use the generating burner. On a cook stove or range the heater fits in the opening of a 9-inch lid and covers the opening of an 8-inch lid. Where used with a stove burning soft coal open the back damper, allowing the smoke to pass up the chimney, and regulate the heat with the front damper. The same heat is required in using this device as when the irons are placed on the top of the stove, but it possesses the advantage that four irons are heated while occupying the space of one lid. The irons are not soiled in any way by the employment of the heater above described.

North's Sad Iron Heater.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, PA., June 5, 1888.

Pig Iron.—The market has not assumed any very definite character as yet, and may therefore still be called a waiting one. Consumers are either buying from hand to mouth, or else insisting on concessions, which are not readily available on desirable brands. There is a great deal of Iron that can be had at low figures, but, in most cases, quality is either uncertain or below standard, so that prices in such cases are irregular and subject to special arrangement between buyer and seller. Some of the largest consumers are picking up lots of what they claim to be good Mill Irons at from $15.25 to $15.75, delivered, but in ordinary cases $16 @ $16.50 are said to be firm quotations. But everything depends upon circumstances. A consumer that can take 500 to 2500 tons, and can pay cash for it, has a decided advantage in dealing with weak parties, and by the same rule a producer with light stocks and an established trade for his brand can secure comparatively good prices, although, of course, quality is an important factor. The same remarks apply in some measure to Foundry Irons, but, with the possibility of an increasing scarcity of really good brands during the hot weather, holders are disposed to be somewhat firm, particularly on the higher qualities. The weak spot in the market is in the inferior or new brands, and it is impossible to predict with any degree of confidence what the outcome will be. Several furnaces in the Lehigh district are preparing to blow out, but the continued outpour of Iron from the South and West shows no signs of abatement, so that of one kind or another there is plenty of Iron, and even at the low rates now current, there are more sellers than buyers. In discussing the position with leading operators we find a singular reticence in expressing an opinion in regard to the future, from which it is probably safe to assume that the outlook is not encouraging, and that all parties are disposed to wait developments before taking any decided position in the market. A larger volume of business has been done during the past week, however, which some regard as indication of returning activity. But a careful examination of the facts does not confirm this opinion, as the largest (so-called sales) were mere options, and contingent on certain other deals which may or may not be completed, while the lots actually closed were at prices showing anything but a healthy market. Still, there is room for a very sudden and a very marked improvement, to ignore which would not be wise on the part of those interested. Hence, while the immediate outlook is far from encouraging, a sharp lookout is being kept for possibilities in the other direction. Stocks of good Iron are light, many of the more prominent furnaces are out of blast, and, owing to the scarcity of good Ores and other influences, are not likely to be put in operation, so that whatever may be the case with ordinary qualities, good Irons will be likely to remain scarce for a long time to come. Meanwhile tariff agitation, unfavorable crop reports and the excitement attending the Presidential elections and the uncertainty in regard to labor, are all inimical to an early improvement, so that for the present, at least, a dull, irregular and unsatisfactory market is all that can be fairly expected. Prices are quoted at $19 @ $19.50, at tide, for choice No. 1 Foundry, $18 @ $18.50 for Standard do., $17 @ $17.50 for No. 2, and $16 @ $16.50 for Gray Forge. Southern Irons are nominally $15.50, $16.50 and $17.50 for the three grades, but some brands in round lots could be made available at considerably lower figures. A 2000-ton lot of Bessemer (part foreign Ore), very low in phosphorus, was sold at a trifle below $17.75, at furnace, for delivery to one of the Steel companies

Foreign Iron.—No business doing; prices nominal as last quoted, viz.: $20.50 @ $21 for special brands, $19.25 @ $19.50 for ordinary, and $26.50 @ $27 for 20 % Spiegel.

Blooms.—In domestic Blooms there is quite a good demand, but nothing doing in foreign. Prices steady and unchanged, as follows: Domestic Rail Blooms, $28 @ $28.50, Slabs and Billets from $29 to $35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite $42 @ $44; Scrap Blooms, $34 @ $35 ₱ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $30 @ $31 for Nail Slabs; $31.50 @ $32.50 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—The market is extremely dull, and prices hard to arrange between buyer and seller. For a good quality of Bars sellers ask $27.50 to $28 at mill, and while there are Bars to be had as low as $27, buyers want a good quality delivered to them at from $27.50 to $28, so that very little business has been done, although a few small lots were taken at about $28, delivered.

Bar Iron.—The general report in the Finished Iron trade is one of improvement, as regards the volume of business, but not so in prices. The Bar trade has not participated in the movement directly, but the Skelp mills have had material additions to their orders, and as there is still more business offering the feeling for the time being is a shade better. Prices are very low, however, and such a thing as asking an advance, even on the inside figures, is hardly thought of. Still, if the mills can run full it will be a decided help to them, and may, perhaps, after awhile be followed by better prices. But there is nothing yet that can be taken as an indication of permanent improvement, so that, as we said before, manufacturers are taking in all the orders they can get at the prices recently ruling, which are probably from 1.75¢ to 1.85¢ for Best Refined Bar Iron, and 1.8¢ to 1.82½¢ for Grooved Skelp. As to Bar Iron there is a good deal of disparity in prices. Some of the leading mills claim that 1.85¢ @ 1.9¢ are their inside figures, while others claim that 1.75¢ @ 1.8¢ is all that they can get. The difference is probably either in quality or in the specification of sizes, or in both, but no fair idea of the market can be given without quoting it at both ends—viz., highest and lowest.

Plate and Tank Iron.—The Plate mills have made clear gains in their position during the past week or ten days. They have nearly all taken in a moderate amount of business and some are inclined to ask a little more money, although it is doubtful if they will succeed until some of the others are better supplied with orders. Moreover, one swallow does not make a summer, and it remains to be seen whether the recent little spurt is to be followed by anything like permanent improvement. The shipbuilders have been the heaviest buyers, and while 2¢ @ 2.05¢, delivered, is mentioned by some, it is more than likely that 1.92½¢ @ 1.95¢, at mill, will be the price on the greater portion of the order. Another week or two, however, of good business would probably give a strong tone to the market; meantime prices are steady at about the following quotations: Ordinary Plate, 1.90¢ @ 2¢; Tank, 2¢ @ 2.10¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—Nothing beyond the usual run of small orders has been taken recently, and some of the mills in certain departments are beginning to want work badly. There is still a good deal doing on old contracts, however, which, with fair probabilities of new work coming on the market in course of a few weeks, prevents the feeling of uneasiness, which is sometimes felt in other branches. Prices are unchanged and in most cases quoted about as follows: 2.05¢ @ 2.10¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—The market is fairly active, but at most unsatisfactory prices, buyers of large lots standing off for large concessions, which on inferior makes are usually obtainable, the supply of that class of Iron being very large. Small lots of best makes are still held at about the following quotations:

Best Refined, Nos. 26, 27 and 28	3¼	@ 3½¢
Best Refined, Nos. 18 to 25	3	@ 3¼¢
Common, ¼¢ less than the above.		
Best Bloom Sheets, Nos. 26 to 28	4½	@ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4	@ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3½	@ 3¾¢
Blue Annealed	2.8	@ 3 ¢
Best Bloom, Galvanized, discount	62½ %	
Common, discount	67½ %	

Steel Rails.—Nothing doing except in small lots, at about $31 at mill. There is no inquiry of importance from large buyers, and it looks as though prices would not be maintained, although the demand for Steel in other shapes is quite active, and in some measure offsets the falling off in Rails. Asking prices for Rails, $30.50 @ $31 at mill

Old Rails.—There is no demand whatever, and while T's in store here are still held at from $21.50 to $22, buyers could not be found at anything near those figures, so that the asking prices are no criterion of what could be obtained in the open market. Bids of $20.50 are asked for lots in New York, and that figure could doubtless be shaded on a firm offer for lots there or at equivalent prices elsewhere.

Scrap Iron.—Market about as dull as it can be, although prices are nominally as quoted before, say, $19 @ $20, asked, for cargo lots; $20 @ $21 for carload lots, delivered, or for choice $21.50 @ $22; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $19 @ $20; Cast Scrap, $14 @ $15; do. Borings, $9 @ $10; Old Fish Plates, $24 @ $25. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—Some little improvement is noticeable in the demand, but as yet there is no quotable change in prices, and manufacturers claim that at the figures now ruling they are working pretty close to actual cost and are therefore not pushing trade to any extent. Discounts on small lots are quoted as follows: Black Butt-Welded, 55 %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 55 %; on Boiler Tubes 60 %.

Nails.—The depression which has prevailed in this department for some time past continues. Mills are working only about half time, and sales during the past month were considerably smaller than the corresponding period of last year. Small lots from store are quoted at from $2 to $2.05, with the usual discount to buyers of large quantities. The Atlantic States Association holds a meeting in this city at the Continental Hotel on the 6th inst.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, June 4, 1888.

Pig Iron.—The downward course of prices is still unchecked. An increased number of furnace companies are insisting that the decline has gone far enough, and that they will cease production rather than make further concessions, but they are without influence in effecting an improvement in the situation as long as the demand continues light and other furnaces are actively seeking orders for Pig Iron. Sellers of Lake Superior Charcoal are looking forward to the time, which is rapidly approaching, when manufacturers of agricultural implements will be in the market to contract for their season's requirements, and they also expect to sell a considerable quantity to other consumers of Charcoal Pig, but it is quite probable that the competition for this class of orders will be so keen as to depress still further the price of even this choice quality of Iron. In soft Irons the No. 1 grade is reported quite scarce from various causes, but No. 2 is abundant and can be had below the usual difference. In Southern Coke Iron the only new feature which has developed is a disposition on the part of some companies to sell at still lower prices for forward delivery, presumably on account of the blowing in of new furnaces or the expiration of old contracts. Cash prices, f.o.b. Chicago, are about as follows: Lake Superior Charcoal, all numbers, $19.50 @ $20; Alabama Car Wheel, $26.50; Southern Charcoal Foundry, No. 1, $19; No. 2, $18; Jackson County Softeners, No. 1, $18 @ $19; Hocking Valley, Soft Foundry, No. 1, $17.50 @ $18.50; American Scotch, (Blackband) No. 1, $19.50; other Ohio Scotch Irons, No. 1, $17.50 @ $18.50; Lake Superior Coke, No. 1, $17.50 @ $18.50; No. 2, $16.50 @ $17; No. 3, $15.50 @ $16; Southern Coke, No. 2, $17.25; No. 2½ and Open Bright, $16.75; No. 3, $15.75; No. 1 Mill, $15.25 No. 2 Mill, $14.75.

Bar Iron.—A few good specifications from jobbers and manufacturing consumers made their appearance during the week, but the aggregate mill business was very light in comparison with the usual volume of trade. Manufacturers' agents still quote 1.62½¢ @ 1.65¢, f.o.b. Chicago, half extras, for good Common Iron, but orders larger than carloads are the subject of very active competition. Store prices range from 1.75¢ to 2¢, according to quantity and quality.

Structural Iron.—A contract for 500 tons of Steel Beams for a large office building in this city was awarded to a Pittsburgh company. The erection of other large buildings is contemplated, but the plans have not yet matured. Bridge work is scarce. Prices from store are as follows: Angles, 2.40¢ @ 2.70¢; Tees, 2.60¢ @ 2.90¢; Beams and Channels, 3.80¢. Mill prices for carload lots, f.o.b. Chicago, are as follows: Angles, 2.20¢ @ 2.25¢; Universal Plates, 2.25¢; Tees, 2.50¢ @ 2.55¢; Beams, 3.40¢.

Plates, Tubes, &c.—Chicago dealers report a satisfactory condition of trade, although the bulk of it consists of small sales and the scope of their operations has been extended outside of the usual territory covered. Store quotations are as follows: Heavy Sheets, Nos. 10 to 14, 2.60¢ @ 2.70¢; Tank Iron, 2.50¢ @ 2.60¢; Tank Steel, 2.75¢ @ 3¢; Shell Iron, 3¢; Shell Steel, 3¢ @ 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 62½ % off on 2½-inch and larger and 60 % off on 2-inch and smaller.

Sheet Iron.—Large buyers have been placing their orders quite freely of late for Black Sheets, although some are postponing their purchases until later in the season under the impression that prices will be lower. No. 27, is quoted at 2.85¢ @ 2.90¢, f.o.b. Chicago. Very little is doing out of store. Jobbers still quote 3.30¢ for No. 27, with concessions to best buyers.

Galvanized Iron.—A steady but by no means brisk trade is reported by both manufacturers' agents and jobbers. Small lots are quoted at 60 % and 5 % off for Juniata and 60 % and 10 % off for Charcoal.

Merchant Steel.—The beginning of a new month brought the usual increase in orders from regular customers, but beyond that nothing has occurred of an encouraging nature. No large contracts are yet in sight. The demand for Tool Steel from the mining regions is still very light. Store prices are as follows: Bessemer Bars, 2.45¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.65¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—Reports from outside sources indicate the receipt of several large orders recently by the mills in this locality, but these reports are not confirmed by the parties interested. They state that business has been very quiet. A few orders are in sight, but every mill in the country appears to be asked for bids on them, and the intervention of brokers is being sought by the railroad companies to a greater extent than ever, in their anxiety to secure the lowest prices attainable. Quotations range from $32 to $33, but the market is very weak under the circumstances.

Old Rails and Wheels.—Sales of old Iron Rails were made early in the week at $19.50, but they are now being offered at $19. Large consumers bid $18.25. A sale of old Car-Wheels is reported at $20, but this is regarded as an exceptional transaction, as the ordinary run of Wheels would not command more than $18.50 @ $19.

Scrap Iron.—The local dealers report quite a number of transactions since our last report, but business is still far from active. The supply of Scrap is becoming very abundant. Dealers are offering $12 @ $12.50 for Mixed Country Scrap. Selling quotations for carefully selected are as follows ℔ ton of 2000 lb: Railroad Shop or No. 1 Forge, $18 @ $18.50; Track, $17; No. 1 Mill, $13 @ $14; Light Wrought, $8.50 @ $9; Horseshoes, $18; Axles, $23 @ $24; Machinery, Cast, $13.50 @ $14; Stove Plate, $11; Cast Borings, $9; Wrought Turnings, $11; Axle Turnings, $12.50; Coil Steel, $12.50; Leaf Steel, $13.50; Locomotive Tires, $14.50. A lot of Choice Bridge Scrap was sold for $17.25, and some high grade No. 1 Mill brought $14.75.

General Hardware.—Jobbers in Shelf Hardware are having a good trade in Farming Tools and other seasonable goods. In Builders' Hardware the demand is improving with the advance of the season. Houses making a specialty of Builders' Hardware, however, are complaining of the slack demand they are having, in consequence of the small number of office buildings and high-class residences now being erected. Heavy Hardware maintains its course with remarkable evenness. No change worthy of note has occurred in prices.

Nails.—Very little is doing, either from factory or from second hands. Prices of Steel Cut Nails are very irregular. Some manufacturers quote fully 10¢ ℔ keg more than others are selling at, and the great majority of them are refusing to compete with the leaders in the recent cut. The usual quotation from factory is $1.95 @ $2, f.o.b. Chicago, for Steel Nails. Jobbers still quote $2.10 for Steel, and $2.70 for Wire Nails in small lots, with the usual reduction for carloads.

Barb Wire.—This branch of trade keeps in very satisfactory shape as compared with most others. The demand is good and prices are fairly well maintained. St. Louis parties are reported to be cutting to some extent, but the factories hereabout are so well supplied with orders that for the present this market is not affected. The price for small lots is still 3.10¢ for Painted and 3.85¢ for Galvanized.

Pig Lead.—About 700 tons were purchased by consumers at 4¢. Offerings are not heavy, but sufficient to meet the demand for consumption.

Copper.—Some demand exists for Manufactured Copper, but the market is not at all active.

M. A. Mihills, 166 Lake street, Chicago, formerly Western agent for the Salem Wire Nail Company, has been appointed exclusive sales agent for the Wetherald Wire Nail Company, of Findlay, Ohio. This is an entirely new company whose works were started last week. They now have upward of 50 machines and will add more as their trade requires them, having provided ample space for enlargement.

The announcement is made that a license of incorporation has been granted to Joseph T. Ryerson & Son, dealers in Plate and Sheet Iron and Steel, Chicago; authorized capital, $240,000; incorporators, Edward L. Ryerson, Arthur Ryerson and Herman B. Butler. The stock sheet of this house for June has just been received, giving full details of the quantity, sizes, &c., of goods on hand, together with a great deal of information useful to boiler makers.

Louisville.

LOUISVILLE, KY., June 4, 1888.

Pig Iron.—The condition of the market has not improved, and prices are about the same as last week. But few buyers are willing to buy more than for current demand, and 100-ton orders are scarce. Many of the most conservative furnacemen now feel that it is better to let the market reach bottom as soon as possible, believing that prices are so demoralized that no improvement can be expected until prices have still further declined. They think that the present condition of the country will not justify the Iron market remaining on such a low basis for any great length of time, and that by fall there will be a change in the present market, with a tendency upward. It looks as if now would be an excellent time for contracting for a long time ahead, as the chances are that before a contract made to run throughout the year would be completed there will be an improvement that will make purchases at present prices seem desirable. Purchase has already been made for what Iron is desired for the year by two or three parties who usually buy in June and July, who feel that the present price of Iron is very low, and prefer to contract now rather than run the chance of buying lower during the next two months.

Southern Coke, No. 1 Foundry	$17.00 @	$18.00
" No. 2 "	16.00 @	17.00
" No. 3 "	15.50 @	16.50
Hanging Rock Coke, No. 1 Foundry	17.50 @	18.50
Hanging Rock Charcoal, No. 1 Foundry	21.50 @	22.50
Southern Charcoal, No. 1 Foundry	18.00 @	20.50
Silver Gray, different grades	14.50 @	15.50
Southern Coke, No. 1 Mill, Neutral	14.50 @	15.50
" No. 2 " "	14.00 @	15.00
" No. 1 " Cold Short	14.00 @	15.00
White and Mottled, different grades	13.50 @	14.50
Southern Car-Wheel, standard brands	20.50 @	23.50
Southern Car-Wheel, other brands	18.50 @	20.50
Hanging Rock, Cold Blast	22.50 @	23.50
Hanging Rock, Warm Blast	18.50 @	19.50

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, PITTSBURGH, PA., June 5, 1888.

The general business and industrial situation continues in an unsettled and unsatisfactory condition, and the prospect for immediate improvement is not as encouraging as it might be. The scale committees of the Iron manufacturers and Amalgamated Association have had no conference as yet, but will within a few days. What the result of the conference will be is difficult to foretell. It is very certain that a reduction will be demanded, but whether it will be accepted is another thing. The Iron workers, while admitting that the Iron business is in an unsatisfactory state, think the present wage scale is low enough, and that they should not be asked to make any reduction thereon. They are willing to renew the present scale. Pittsburgh manufacturers say they must have a reduction in order to compete with the East, where the cost of skilled labor is much less than here, and thus the matter stands at present. Pittsburgh has sustained a great loss in the death of Capt. Richard C. Gray, who died at the Fifth Avenue Hotel, New York, last week. Captain Gray was one of the most successful steamboatmen on the Western waters. He was identified with a number of Pittsburgh banks, insurance companies and street railroads, and was largely interested in the Black Diamond Steel Works, being a brother-in-law of James Park, Jr., deceased, who was one of the best Steel manufacturers in the country. Captain Gray left a large and valuable estate, and by his will about $100,000 will be divided up among various charitable institutions of this city. He was president of the Peoples' National Bank of this city at the time of his death. The men at the National Tube Works, some 3000 in number, have accepted the reduction in wages of from 7½ to 10 %, and now the Pennsylvania Tube Works demand a reduction of 10 %. It is probable those other Pipe mills that have not already secured a reduction will demand one.

Pig Iron.—There has been little or no change in the general position of the market during the week. Furnacemen and brokers report that at no time since 1873 has the business been in so unsettled and unsatisfactory condition as at present. Demand is still confined to supplying immediate actual wants of consumers, and prices are uncertain and unremunerative. Mill owners, while admitting that Pig Iron is very low and that there is no margin for profit at present prices, do not know but what there will be a shut-down next month, and they are not buying a ton more than they can possibly help in consequence. While prices remain the same as those of a week ago, there is not likely to be any improvement in demand, unless the wage scale has been disposed of. With this matter settled without a strike there will doubtless be an increased demand, as the consumers generally are satisfied that prices will not go much, if any, lower; thus they are very low in stock, as they all made it a point, in view of the possibility of a strike, not to carry a ton more than they could help. We quote prices as follows:

Neutral Gray Forge	$14 25 @	$14.75,	cash.
All Ore Mill	15.50 @	15.75	"
No. 1 Foundry	16.75 @	17.00	"
No. 2 Foundry	16.00 @	16.25	"
No. 3 Foundry	15.00 @	15.75	"
Charcoal Foundry	22.00 @	24.00	"
Cold Blast Charcoal	26.00 @	28.00	"
Bessemer Iron	16.25 @	16.50	"

There have been rumors of sales of Bessemer as low as $16, cash, but so far as your correspondent can learn there are no sellers of good reliable brands under $16.50, cash. Sales of White Bessemer at $15.50, cash. For well-known brands of Neutral Gray Forge, $14.50 @ $14.75, cash, are the ruling prices.

Muck Bar.—We continue to quote at $26 @ $26.50, cash. Some mill owners refuse to accept less than $27, cash, but consumers have no trouble in buying within the range of our quotations. The fact that one firm or man refuses to sell below a certain price does not make the market, when buyers can get all they want at a lower price.

Manufactured Iron.—There is nothing new to report. With the possibility of a strike next month orders are now possibly coming forward a little more freely, but they are mostly small, and manufacturers, for the same reason, are anxious to clear their order books and work up all the raw material they have on hand. Prices continue weak and unsettled, and have afforded little or no margin for profit for some time past. Bars are quoted at 1.70¢ @ 1.80¢; Plates, 2.15¢ @ 2.20¢; No. 24 Sheet, 2.70¢ @ 2.80¢; 60 days, 2 % off for cash.

Nails.—There is no improvement to report; trade continues slow and unsatisfactory, with but little prospect of any immediate improvement. Our manufacturers are still refusing to sell below $1.90 basis, but they are being offered for considerably less elsewhere. The Eastern and Western manufacturers have been engaged recently in an effort to get up a new card, one that will suit both sections, and, if successful, it will go into effect on July 1. Manufacturers here say that the Nail business could not possibly be in a much worse condition than it is at present; that, in addition to a very light demand, it is impossible to obtain a remunerative price, excepting in a small way.

Wrought-Iron Pipe.—There has been no improvement in the Pipe trade. It is in an exceedingly depressed, unsettled and unsatisfactory condition. Some firms are very indifferent about obtaining orders, as they think they may as well do nothing as work for nothing. As noted elsewhere, some of the mills have obtained a lower wage-scale, but it is feared that whatever may have been gained in this way will be followed by increased cutting, so that the buyer of Pipe will get the best of it. There is no department of the Iron business so much overdone, quite a number of new mills having been added to the list within the past two or three years.

Old Rails.—There have been no sales reported during the week under review; demand appears to have dropped off, and prices are weak and lower. We now quote at $21.50, cash, for American Tees. It is rumored that they can be bought for less, but we are cognizant of no bonafide offers to sell below the price quoted, which is a reduction of fully $1 ℔ ton on the price of a month ago.

Steel Rails.—There have been no sales reported here recently, in the absence of which we continue to quote at $31.50, cash, on cars at works in Pittsburgh.

Billets.—Bessemer Steel Billets and Slabs are quotable at $28 @ $28.50, cash, at sellers' works, as to quality, size and delivery. Some of the mills are pretty well sold up. Rail Ends are quoted at $17 @ $17.50. Sale American Wire Rods reported at $42.

Merchant Steel.—Manufacturers continue to report trade dull, but they make no change in prices. Best brands of Tool Steel at 8½¢; Crucible Spring Steel, 4½¢; Crucible Machinery 5¢; Open-Hearth do, 2½¢.

Railway Track Supplies.—Demand continues light for the season, and prices are weak and unsettled. Spikes quotable at 2¢ @ 2.10¢, 30 days, delivered; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, 2.85¢ with Square and 2.95¢ with Hexagon Nuts. It is intimated that Spikes for desirable orders can be bought below the price above quoted

Old Material.—Trade continues slow, while prices remain unchanged. Sales No. 1 Wrought Railroad Shop Scrap at $20 net ton; do. Track, 90¢ ℔ 100 lb; Wrought Turnings, $13 @ $14; Car Axles, $25 @ $26; Cast Borings, $11.50 @ $12 gross; Car-Wheels, $20 gross; Cast Scrap, $15 @ $16 gross.

Window Glass.—Trade is slow, while prices remain unchanged. Discounts on Single Strength in carlots, 75 % and 10 %; Double Strength, 75 % and 10 % and 5 %; Chicago freight allowed. It is not settled yet whether the factories will close down June 15 or July 1.

Chattanooga.

Office of *The Iron Age*, Ninth and Carter Sts., CHATTANOOGA, TENN., June 4, 1888.

Pig Iron.—The situation, so far as prices are concerned, has undergone but little change during the past week; they are quite irregular, to say the least, and it is impossible for any one to make quotations or figures that buyers could with safety base their purchases upon. There have been sales of several large round lots, deliveries to run through the summer and fall, but the figures are not made public. It is conjectured that some of the purchases have been made on speculative account, and from the nature of the transactions it looks very much that way. There is yet no letting up of inquiries from the East for small round lots of our best foundry brands, and a number of sales have been made at $19 for No. 1 delivered, and one sale of 500 tons was made at $19.25. The general opinion is that prices will hardly go lower, and at these figures there is scarcely a furnace in the South that cannot continue to run and make some money. The demand for Forge grades is not up to the production, and prices are tending down; anything like a definite quotation on this grade, if large lots were being negotiated for, would not be a criterion of the market. The new stacks that have just blown in are, so far as heard from, turning out a very satisfactory quality of Iron, and is finding a market about as fast as it is being turned out. Many of our Southern furnaces have booked contracts that will take their entire output for some months yet to come, while others are depending upon sales which they make from time to time for their market, which so far have kept their yards clear of metal. The Commissioners of the Southern Steamship Association have issued their rates on Pig Iron North and West, to take effect on the first of this month. It does not differ in any respect from rates issued on May 1.

Miscellaneous.—The celebration of the opening of the Broad Gauge to the top of Lookout Mountain on the 29th and 30th of last month was a partial failure, owing to the continued and heavy rains that prevailed on those two days. While the capacity of both the Incline and Broad Gauge were taxed to their utmost, there were not less than 3000 to 4000 people who were unable to get up, and those who did go up experienced a very unsatisfactory time, although under all the difficulties nearly $100,000 worth of lots were sold.

Cleveland.

CLEVELAND, June 4, 1888.

Iron Ore.—Good Gogebic Ores can now be purchased for $4.75 ℔ ton, although the highest grades bring 25¢ more. Menominee Bessemers are bringing the same figures, the Chapin and one or two other mines still asking $5, while the weaker mines are letting go their output at $4.75. Very fair lots of non-Bessemer Ores have been sold during the past week at $3.75

℔ ton, f.o.b. vessels Cleveland and Ashtabula. The output of the upper lake district is now placed at about 4,000,000 tons, the market having shown an unexpected activity. Sales for the past week have been confined to small lots of from 5000 to 10,000 tons each, but the aggregate amount of Ore sold probably exceeds that of any week since the opening of the season. Menominee range Ores have sold very freely, the non-Bessemer bringing $3.75 @ $4, and the Bessemers $4.75 @ $5. Red Hematites, Bessemers, are offered at $5, and sales are reported at $4.75, the non-Bessemers bringing $3.75. The receipts of Ore at all Lake Erie ports for the past week exceed 50,000 tons, while the shipments are in excess of that figure. The following are the quotations:

No. 1 Specular and Magnetic Ores, Bessemer quality	$5.75 @ 6.00
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	5.00 @ 5.25
Red Hematite Ores, Bessemer quality	4.75 @ 5.00
Red Hematite Ores, Non-Bessemer quality	3.75 @ 4.00
Menominee Range Ores, Bessemer quality	4.50 @ 5.00
Menominee Range Ores, Non-Bessemer quality	3.75 @ 4.00
Gogebic Range Ores, Bessemer quality	4.50 @ 5.00

Pig Iron.—There are no encouraging features noticeable. Considerable Iron is going into consumption but at very low figures and in very small amounts. Not a prominent dealer in the city has recorded any substantial orders during the past week. Some No. 1 Foundry Iron is being sold, but five carloads would be a heavy order. Lake Superior Charcoal Iron, all numbers, is quoted at $21.50 @ $22.50 with the best Foundry Irons selling all the way from $17 to $19. Dealers anticipate better business after the middle of the month.

Old Rails.—The market is not active, but a fair order of Old Americans was sold during the week at $21. Old Wheels seem to be in no demand.

Nails.—A reduction of 10¢ ℔ keg on Wire Nails, making the price $2.60 instead of $2.70, is the only change. Iron Nails are still quoted at $1.95 and Steel Nails at $2.05 ℔ keg.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, June 4, 1888.

Pig Iron.—Notwithstanding weakness is the most conspicuous feature in the local market for Pig Iron, there have been other developments recently which have dulled the keen edge of this fact. It is evident to a close observer that there is a feeling of greater confidence on the part of buyers, who, however, are not desirous of being known as entertaining opinions of a favorable nature, and there is less urgency on the part of sellers. Furnaces now, North, South and East, are either banking up or blowing out in obedience to the immutable law of the survival of the fittest. Stocks at the furnaces during the month of May have been reduced in very many instances, and it is estimated by individuals that the official report, soon to be out, will show this fact in a marked degree. Sales during May have been larger of old material than for some time, but the volume of business in new Pig and Manufactured Iron makes no such comparison. One large Southern company, which may be taken as an example, sold in April about 55,000 tons and during May only 21,000 tons. It is claimed by some observers that by reason of recent action on the part of furnaces consumption is already ahead of production, and the further changes which are contemplated will demonstrate this position beyond a peradventure within a short time. The miners' strike in Alabama has already restricted the output in that section; both stacks of the Eureka Company are idle. Sloss, too, is out, but not from this situation. Foundry Iron is still relatively scarce and much better sustained in price than mill grades. It is claimed by Southern producers that they have no outlet for Mill Mottled Iron except in the North now, where freights are against them, and to come in competition with Northern make they have been obliged to sell at lower prices. There have been moderate sales of No. 2 Foundry Iron during the week at 16.50¢ @ 16.90¢, mainly at the inside price. Small sales of Lake Superior Iron have been made to local consumers. The demand for Car-Wheel Iron has been more active, and sales of 2600 of Woodstock, Clifton and Shelby have been made for fall delivery on a basis of $25 cash here, in lots of 1200, 1000 and 400 tons; 1000 tons Soft Stove Coal Iron sold by sample at about $14, prompt delivery; 1000 No. 1 Mill, Southern, at $14, and 2000 tons do at $14.25, cash, for summer delivery, and 1000 tons Mill and Mottled Iron sold on a basis of $12.75 for Mottled and $13.50 for No. 2 Mill. Prices current here for cash, with further revision, are as follows:

Hot-Blast Foundry.	
Southern Coke, No. 1	$17.00 @ $18.00
Southern Coke No. 2	16.00 @ 17.00
Southern Coke, No. 3	15.00 @ 16.00
Ohio Soft Stone Coal, No. 1	17.00 @ 18.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.00 @ 18.00
Hanging Rock Charcoal, No. 1	20.50 @ 22.50
Hanging Rock Charcoal, No. 2	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No 2	17.00 @ 18.00
Forge.	
Strong Neutral Coke	13.50 @ 14.00
Mottled Neutral Coke	12.50 @ 13.00
No. 1 Mill Coke	14.00 @ 14.25
No. 2 Mill Coke	13.00 @ 13.75
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	21.00 @ 22.00

Manufactured Iron.—The market for Bar, Sheet and Structural Iron has been quiet and an easy tone has prevailed, but prices have been without essential change. Bar and Sheet Iron—Common Bar Iron, 1.90¢ @ 2¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Nails.—The market has been easy, with the jobbing demand readily met at previous prices and round lots obtainable at lower prices; 10d @ 60d sell at $2 ℔ keg, and other sizes at proportionate rates. Steel Nails sell at $2.05, and Steel Wire at $2.75 @ $2.80 ℔ keg.

Old Rails and Wheels.—There has been a moderate demand and a steady market for Rails, with small lots selling at $20.25 and 2000 tons at $20, cash, here and in St. Louis. There has been less call for Wheels, but the market has remained steady at about $19 for desirable lots.

Messrs. Thomas, of Birmingham, write that the new Southern Coke Iron, Pioneer, is now being placed in Cincinnati, Chicago, Detroit, St. Louis and the Eastern cities. The Pioneer is a strong, dark Foundry Iron. Samples of it shown here are exceptionally fine.

Detroit.

WILLIAM F. JARVIS & Co., under date of June 4, report as follows: While there is no improvement in prices to report, there certainly is a large number of inquiries and several good-sized orders have recently been placed. In some cases buyers have made offers for round lots of standard brands, both Lake Superior Charcoal and Coke Iron, at 25¢ below quotations made by the furnaces, and offers were refused, the buyers finally accepting at prices quoted by sellers. The demand for prompt delivery is requested in almost all cases when a sale is made, whether it is for a carload or more, thus showing that stocks in the hands of consumers are exceedingly small. From present indications this month will show a very large business, and, as stocks at furnaces are growing less, it may result in an advance before July 1. There is very little prospect for lower prices, especially for Lake Superior Charcoal and best brands of Northern Coke Irons. We quote as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $21.00
Lake Superior Coke, All Ore	19.25 @ 20.00
Lake Superior Coke, Cinder Mixed	18.25 @ 19.00
Standard Ohio Blackband	19.25 @ 19.75
Southern No. 2	18.00 @ 18.50
Southern Silvery	17.25 @ 17.75
Southern Gray Forge	15.50 @ 16.00
Jackson County, Ohio, Silvery	18.50 @ 19.00
Old Wheels	20.00 @ 20.50

New York.

Office of *The Iron Age*, 66 and 68 Duane St., NEW YORK, June 6, 1888.

American Pig.—There has been no improvement in the tone of the Iron market in this section, business being restricted practically to retail transactions. One feature is worthy of consideration, since it will offset the fact of a slight increase of production which we show in our monthly statistics, and that is that the season is approaching when the proportion of Soft Irons naturally made in the blast furnaces is low. Reports from the South even now begin to indicate that leading plants running there are turning out a heavy proportion of Mottled and other low grade Irons. The climatic conditions whose influence in the North is well known are more pronounced in the South, and it is no reflection on furnace management in that section that their effect upon the grade is more marked. It seems to begin earlier, and may hold out longer. The effect will probably be to make No. 1 relatively scarce, while lower grades will be more abundant. Even now the sales of the latter are being more urgently pressed, and it seems likely that what further weakness is developed will appear there first. We quote standard brands of Lehigh Pig, No. 1 Foundry, $18 @ $18.50; No. 2 Foundry, $17 @ $17.50, and Gray Forge, $16 @ $16.25, tide water delivery, with outside brands selling 50¢ @ $1 less.

Scotch Pig.—The bulk of the Iron arriving is sold, but occasional lots have gone into store during the past few weeks. We quote: Coltness, $20 @ $20.50; Summerlee, $19.75 @ $20; Langloan, $19.50, and Dalmellington, $18.25 @ $18.50.

Bessemer Pig.—Further weakening of domestic Bessemer is reported.

Spiegeleisen.—During the week two lots, aggregating 1500 tons, of 30 % were sold to a Western Steel works at prices reported to be ranging between $31 @ $31.50 here, the smaller lot having been sold at or near the lower figure.

Foreign Ore.—Sales of a few cargoes of Bilbao Campanil have been made on the basis of 9¢ @ 9½¢ ℔ unit for Bessemer stock. This Ore has been sold at the low figures named because it had reached this port without having found takers. It is Ore which is sent in comparatively small blocks to fill up cargoes of other merchandise.

Bar Iron.—Low figures are reported to have been made by Mahoning Valley mills at New England points. Both parties to the Western wages scale are now getting into position for the annual contest. So far as is known now a reduction in some form will be demanded by the manufacturers, while the men will ostensibly hold out for the present scale. The condition

of the trade is such that the manufacturers have a good cause. East of the Allegheny Mountains a general reduction has taken place, and it may be questioned whether the men in the West will seriously hold out against a lowering. We quote carload lots, on dock, half extras, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 1.9¢.

Structural Iron.—The Phœnix Iron Company have secured the large contract for the Arcade Company, the details of quantity not having been given out. We quote: Bridge Plates, 1.95¢ @ 2¢; Angles, Iron and Steel, 2¢ @ 2.2¢; Tees, 2.5¢ @ 2.7¢; Channels and Beams, 3.3¢, on dock.

Plates.—We quote: Tank, 1.9¢ @ 2¢; Shell, 2.15¢ @ 2.30¢; Steel Tank, 2¢ @ 2.15¢; Shell, 2.15¢ @ 2.25¢; Flange, 2.6¢ @ 2.75¢, and Fire-Box, 3¢ @ 3.25¢.

Steel Rails.—The market is exceedingly dull, the only sales reported being a lot of about 2000 tons at $31.50, tidewater, the reports of $30 and less being erroneous. The sale of 5000 tons to a new road in Western Pennsylvania by a mill of that section at $31.50, delivered, is also announced. We continue to quote nominally $30.50 @ $31 at Eastern mill, with the market in buyers' favor.

Wire Rods.—A number of sales of round lots have been made for near-by delivery at prices ranging between $40.50 and a shade under $41. There is considerable inquiry, but importers claim that they cannot meet the views of the Wire mills, since with sailer freights at 8/6 @ 9/ Rods cost over $40.

Old Rails.—The market is dull at $20 @ $20.50 nominally for Tees, with no transactions of any importance reported.

Scrap.—We quote $18.50 @ $19.50 for foreign and domestic.

Railroad Fastenings.—The market is very dull, with quotations remaining $2 @ $2.10 for Spikes, and 1.85¢ @ 1.90¢ for Fish Plates, delivered, in round lots.

Metal Market.

Copper.—During the latter half of last week Chili Bars fluctuated in London between £80. 15/ and £81 for spot, and £78. 5/ and £78. 10/, futures, while in this market the syndicate went on absorbing the moderate offerings for near months at 16.60¢, although on Thursday 16.65¢ was paid in two instances, the total dealings not exceeding 100,000 lb, at 16.60¢ @ 16.65¢ for June, and 16.60¢ for July. Little speculative interest was meanwhile shown in the distant months. Monday and yesterday London rose 5/ with spot Bars and futures, the former coming £81. 5/ and the latter £78. 10/, with altogether 450 tons sold, our own market increasing in dullness, a few lots spot and delivery up to August being taken for account of the syndicate at 16.60¢, with further parcels offered at 16.65¢, but without buyers. Meanwhile the later months continued offering at 16¢, but buyers held back, not bidding within ten points of the prices insisted upon. A dispatch from Butte has announced a cave-in on the 3d inst. in the St. Lawrence Copper Mine, which is the principal source of supply for the Anaconda Company. The cave commenced on the 500-foot level, and did not stop until it had gone clear to the 300-foot level, and about 200 feet in length. No Ore can be hoisted for some time, and it will stop the production of 1200 tons of Copper Ore per day, or from 4,500,000 to 5,000,000 lb Fine Copper per month. This morning Chili Bars are firm in London at £82. 10/, against £81. 5/ yesterday, but futures are unaltered at £78. 10/. Best Selected declined during the week from £80 to £79. Two Continental newspapers of note are attacking the syndicate, predicting disaster the moment there will be anything wrong in the money market over there. These papers are the Frankfort *Zeitung* and the Vienna *Neue Freie Presse*. They point to the fact that Mansfeld is not in the syndicate, nor ever will or can be, and that the Hungarian Copper mines which have lain idle when prices were low are now at work every one of them. Our own market today reveals no new features of interest and closes dull at 16.60¢, spot. On the Paris Stock Exchange Rio Tinto shares gave way last week 22 francs, recovering 4½ francs on Monday.

Tin.—The visible supply in Europe and America was, June 1, 23,516 tons, against 20,194 on May 1 and 10,889 on June 1, 1887. As it was expected the same would be more favorable, the bears in London manipulated the market to suit their purposes in consequence, and succeeded in bringing down spot from £85. 10/ to £82. 15/, from which it rallied to £83. 10/ this morning, while futures declined from £86. 10 to £83. 5/ and recovered to-day to £84. 5/. At Penang and Singapore there is no stock and prices rule some £3 to £5 above London. There jobbers are still getting 21¢, while the spot price has weakened to 18½ @ 19¢, and August to 18½¢, with a dull speculative trade. On first call there were sold this morning 25 tons of July Tin at 18½¢. For some time past there have been repeated serious complaints on the part of consumers in Europe of the presence of Iron in Banca Tin. The Netherland Government caused the matter to be investigated, and the correctness of the assertion became patent. The accumulated Banca stocks on the island all more or less showed traces of Iron in the Slabs. It was discovered that the Iron did not exist in the Ores, nor had there been any adulteration, but it appears that the Iron Bars with which the metal in fusion was stirred slowly melted in the extreme heat, and left behind particles of the baser metal. Proper preventive measures have been taken. As per cable dispatch from Gilfillan, Wood & Co. to Mr. Charles Nordhaus, East India agent, 89 Water street, New York, no Tin was shipped from the Straits to this country during May, whereas last year 250 tons were shipped. The May shipments to England were 1000 tons, against 900 in 1887. During the first five months 650 tons were shipped this way, as compared with 1950 during the corresponding period of last year, while to England the shipments amounted to 9900 tons, against 5400. *Tin Plates.*—Spot stocks still continue light, while the demand is moderate. A fair business has been doing in futures at a considerable concession on spot prices, Bessemer Steel Cokes being obtainable at $4.30 @ $4.35, covering deliveries the next four months. We quote at the close large lines on the spot: Siemens-Martin Steel, Charcoal finish, $5.10 @ $5.25; ditto Coke finish, $4.80 @ $4.90; Ternes, $4.35 @ $4.40; Bessemer Cokes, $4.55 @ $4.60 and Wasters, $4.35 @ $4.40. Coke Tins are selling at 12/9 in Liverpool.

Lead—Has been panicky, a good many lots being forced off for cash at drooping figures, and in this manner some 500 to 600 tons of Common Domestic have been placed, beginning with 4¢ and finishing at 3.92½¢, while St. Louis is weak at 3.90¢ @ 3.95¢, and Chicago at 3.85¢ @ 3.90¢. In London there was a decline of 5/, Soft Spanish coming £12. 2/6 this morning, and English Pig £12. 7/6. The Stolberg Company's annual report is not very sanguine on the subject of Lead. "Although Lead has recently receded from 4 to 5 marks the 50 kg.," the report remarks, "the immediate future remains doubtful, especially in the Rhenish district, inasmuch as the two desilvering establishments recently gone into operation at Antwerp will compete with our Lead in Belgium and France, hitherto such a valuable field of ours. Unless, therefore, the duty on Lead be reduced in the United States we may have to make greater sacrifices for placing our Lead abroad than we have hitherto done."

Spelter and Zinc—Has been moderately active and featureless at 4½¢ for Common Domestic and 5¼¢ Silesian, the latter being 7/6 lower in London, now being cabled £16. 2/6. Sheet Zinc has been in good demand, the stock is light and it is bringing 6½¢, Domestic.

Antimony.—A decline from £45 to £42, with Hallett, is cabled from London, but the market here remains supported at 10½¢, Hallett, and 13½¢, Cookson, with a fair jobbing demand.

New York Metal Exchange.

The following sales are reported:

THURSDAY, May 31.

50,000 lb Copper, May	16.65¢

FRIDAY, June 1.

25,000 lb Copper, June	16.60¢
25,000 lb Copper, July	16.60¢
10 tons Tin, spot	19.20¢
10 tons Tin, June	19.10¢

SATURDAY, June 2.

25,000 lb Copper, June	16.60¢

MONDAY, June 4.

10 tons Tin, June	18.65¢
50,000 lb Copper, spot	16.60¢
100 tons Lead, July	4.00¢
50 tons Lead, July	4.02½¢
16 tons Lead, August	4.07½¢

TUESDAY, June 5.

65 tons Tin, July	18.50¢
48 tons Lead, July	4.00¢
144 tons Lead, spot	3.92½¢

WEDNESDAY, June 6.

25 tons Tin, July	18.50¢
25 tons Tin, September	18.75¢

Coal Market.

The Anthracite Coal market during the week has been unusually quiet. June is ordinarily classed among the dull months in the Coal trade, and this year is no exception. The fact will occasion some surprise that the week's production at the mines shows a falling off, as compared either with the previous week or since January 1, the former being not less than 123,567 tons, and for the year since January 1 the decrease is 132,342 tons, as appears from the following:

	Week.		Year.
May 26	661,479	1887	13,739,623
June 2	537,912	1888	13,607,281
Decrease	123,567	Decrease	132,342

Compared with the corresponding week last year the decrease is 39,000. The figures are significant as indicating a purpose to keep the market within control, rather than invite lower prices by an excessive production. Interruption was caused by holiday at the mines. Several mines were drowned out by heavy rains and still others were worked on reduced time. The smaller operators are said to be at a disadvantage in securing cars for transportation. Something is mentioned about a possible suspension of mining by the Reading Company for 10 days. Prices are said to be held firmly to the schedule, inasmuch that, as reported, shippers decline to receive large orders for future delivery at the prices now current. There is still a scarcity of small vessels, which checks Eastern trade. Quotations are as follows: Wyoming free burning, f.o.b. at South Amboy and Weehawken, Broken or Grate, $3.75; Egg, $4; Stove and Chestnut, $4.25; Reading Hard White Ash, at Port Elizabeth, Lump and Steamboat, $4.25; Broken, $4; Egg, $4.10; Stove, $4.25; Chestnut, $4.15; Pea, $3. Free Burning White Ash is the same, except Broken, $3.75, and Egg, $4. Lehigh Coals are for Lump, $4.50; Broken, $4.20; Egg, Stove and Chestnut, $4.10 ₰ ton, f.o.b. at the loading ports.

The Bituminous trade is dull, with some cutting in prices. Several Buffalo firms are named who have secured contracts for Bituminous Coal to the extent of 350,000 tons for the Western terminus of the New York Central, Michigan Central and West Shore roads. It is said that the price was 25¢ lower than last year on the same contracts, and about 35¢ lower than the figures paid by the Grand Trunk Railroad.

The enlarged docks of the Lehigh Coal and Iron Company, at West Superior, have doubled last year's capacity. The dock and shed will be 2500 feet long, with nine automatic derricks. At the new port called Gladstone, on Lake Michigan, the company is completing a large plant. The Northwestern Fuel Company's new Coal dock, at West Superior, is 250 x 1000 feet, and will require 125,000,000 feet of lumber for the trestle work. The Youghiogheny dock adjoining the Northwestern will be 200 x 1800 feet.

Financial.

Trade reports for the week are a chronicle of dullness from a variety of causes, chief among them the intervention of a holiday and bad weather, but the outlook is now more cheering. Crop reports are decidedly better, and the reports of railroad earnings show an unexpected increase. In Kansas the wheat harvest will begin in the Southern counties within a week from this time, and the best yield for a number of years is confidently expected. The harvest is already in progress in Tennessee, and will soon be on the market. The latest crop reports from Minnesota, Dakota and Northern Iowa are to the effect that the outlook for all small grain is encouraging. In Ohio the harvest will be about two weeks later than usual. A Denver dispatch says farmers in Colorado are much elated with the prospects; they believe that the crops this year will surpass any ever gathered, yielding a large surplus for outside wants. The Cincinnati *Price Current*, one of the best authorities, states that the weather recently has been as favorable as it well could have been. No essential changes are made in the estimates of final yield of winter wheat, but the spring wheat crop has had a fair start and promises to equal last year's yield of 163,000,000 bushels.

The total clearings of 38 cities last week were $828,049,686, a decrease of 10.2 %. Outside of New York there was a decrease of 10.5 %. Topeka reported the largest loss, 60.8 %, and New Orleans the greatest gain, 22.2 %. Despite this showing more activity is noted in the New England States among miscellaneous industries. In the New York markets there is little change, aside from a tendency to lower prices for a variety of staple products Wheat is about 4¢ ₱ bushel lower on better crop reports and lower lake freights from Chicago to Buffalo, which were off to 2¢ on grain and 1¼¢ on corn. From St. Louis to this city rates are being cut from 3¢ to 5¢ by some roads. Wheat was taken more freely for export. Oil had another tumble. Values of hog products have also declined, as the result of increased packing at Western centers and a comparatively dull distributive movement. The position of spot coffee is stronger. Refined sugars are in good demand at full rates. Jobbing grocers complain of dullness and venture the opinion that Western centers are diverting business that formerly came to New York. The jobbing demand for dry goods has fallen off since the great flannel sales comprising 20,000 packages, from which $3,500,000 was realized. Business in spot cotton is of better proportions. The Stock Exchange markets have been dull and irregular, varied by reports of rate cutting, and at times strengthened by a continued good inquiry for bonds in London. Bears endeavored to profit from exaggerated reports of Mr. Gould's illness. Much comment was excited by the announcement that the Interstate Commerce Commission have issued a circular calling attention to section 20 of the act to regulate commerce, which authorizes the commission to require annual reports from all carriers interested in Interstate commerce and expressing a belief that every carrier will cheerfully and promptly contribute its share toward the attainment of a complete and trustworthy annual exhibit of the entire railroad system of our country. The commission propose to enter promptly upon an investigation, and will hear arguments by interested parties in this city or in Washington. Government bonds are firm. Among the latest sales are $5000 coupon 4's at 127⅛ and $2000 coupon 4½'s at 107.

The weekly statement of the New York City Associated Banks showed an increase in surplus reserve of $2,578,875. The banks now hold $25,715,625 in excess of the legal requirements. The changes in the average show a decrease in loans of $318,400, a decrease in specie of $4,095,600, an increase in legal tenders of $835,111, a decrease in deposits of $2,726,500, and a decrease in circulation of $212,800. The June interest and dividend disbursements by the railroads exceed $21,000,000, probably the largest amount ever paid. In addition the Government is paying $2,600,000 for interest on the 4½ %, and various States, counties, cities or corporations disburse smaller sums. The only important defaults by railroads are those of the Missouri, Kansas and Texas and Minneapolis and St. Louis, both of which were expected. The effect of these disbursements, together with the cessation of gold exports, is manifest in the abundance of capital seeking investment. Speaking of money, a prominent bank officer says: "It is no longer a question of funds. Loans can be effected on call in any amount for 1½ %, and time money is in abundant supply for four and six months at 3 to 3½ %. The fact is, there is very little demand. We are suffering from a lack of borrowers, and we shall have a plethora of funds all through the summer. Respecting railroad earnings the best authorities promise that the aggregate will surpass those of last year."

According to the Custom House report the exports of specie for the week were $261,116, and since January 1 $17,096,492, as compared with $8,979,000 for the corresponding date last year and $33,437,000 in 1886. The imports for the week were $81,084, and since January 1, $5,000,000.

The Canadian Pacific Railroad $15,000,000 50-year 3½ per cent. land-grant loan has been successfully placed by the Barings in London, at 95, and it has since advanced four points in that market.

The market for sterling was quiet and rates steady. A renewal of gold shipments is not anticipated for some time to come, owing to the recent Reading and Canadian Pacific loans, which are expected to provide an ample supply of bills for a period. Posted rates were $4.87½ for 60 days' and $4.90 for demand.

The May reduction of the public debt amounts to $1,658,696; since June 30, 1887, $99,414,578. The daily purchases of bonds have become insignificant in amount, but the fact causes little apparent anxiety in financial circles, it being assumed that the Secretary will offer stronger inducements to buy if needful for the release of currency. Treasury bond purchases up to date, under circular of April 17, are as follows: Purchased—4's, $13,259,200; 4½'s, $7,522,750; total, $20,781,950. Cost of 4's, $16,795,540; 4½'s, $8,106,946; total, $24,902,486; Cost at maturity—4's, $23,468,784; 4½'s, $8,707,576; Saving—in 4's, $6,678,243,.94; in 4½'s, $600,630; total, $7,273,874. Treasury receipts no longer show an increase compared with last year. The 11 months of the fiscal year amount to $346,458,641.31, against $338,309,909.18 for the same months last year, and the increase, only about $8,100,000, indicates that the expansion of revenue will fall much below expectations.

The imports of merchandise at this port for the week were diminished, the total being $7,829,848. Since January 1 the amount is $204,881,000, as compared with $200,212,000 for the same time in 1887 and $185,414,000 in 1886. The value of the exports for the week was $5,162,314. Included are 300,000 bushels of wheat and 7,647,000 gallons of petroleum.

The entire lot of the City of Detroit 30-year 4 % bonds awarded to the Bank of North America have been sold to savings banks in Connecticut and Massachusets.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, June 6, 1888.

The visible supply of Copper in England and France on the 1st inst. was, as estimated in last week's report, about 70,000 tons. Compared with that of a year ago the total shows an increase of 15,000 tons and is about 25,000 tons in excess of the quantity visible on January 1. There have been no developments of importance the past week as regards business with consumers, or in respect to outside speculation. As a matter of fact both have continued to be on a moderate scale. The transactions have been confined wholly to Chili Bars, for which the syndicate are still buyers at a certain point. Cash warrants are scarce at the present time and the syndicate is represented to have bought up fully 1000 tons during the past week. Furnace material finds very slow sale. Quite liberal quantities have been offered at prices below those previously fixed as minimum rate, but the concessions are evidently no inducement at the present time. English smelters under contract with the syndicate still find it almost impossible to sell at the prices fixed by the latter. The syndicate manifests no tendency to yield on any point, however, but calculates, that imperative wants of consumers will enable them to soon dispose more rapidly of their large holding. It is stated that contracts have been concluded by the syndicate for a large quantity of Japan Copper for delivery over a period of three years. It is estimated that the contracts thus far made by the Société des Métaux with different producers involve no less than 175,000 tons out of the total 275,000 tons annual production, at the average price of £65. They are said to control all the Copper to be produced in Chili this year, besides about 35,000 tons now in stock, the majority of contracts running three years. The Anaconda company's contract has not, as far as can be learned, been extended beyond the one year as per original arrangement. Efforts are making to have it extended to three years, with provision made for diminutions of production by English companies. The latter, it is stated, are agreeable to this providing some American contracts on which there is little or no restriction in the matter of quantity be modified.

Consumers have been liberal buyers of Pig Tin again, but the speculation in the metal continues to be small and values still show considerable irregularity. Shipments from the colonies are small and will be for some time to come. The French holders do not appear to have realized in this market to any remarkable extent the past week.

The Tin-Plate market is somewhat firmer in tone, as far, at least, as near future deliveries are concerned. The decline in the price of Pig Tin induced buyers to take hold of Plates freely at the lower prices named on the latter. This has caused the market to develop a tendency toward more enduring firmness, but as yet distant futures are lower than earlier deliveries.

There has been more steadiness to the Pig Iron market, but except for Cleveland product the demand is still backward. The shipments of Cleveland Pig last month were no less than 108,000 tons, against 74,000 tons during May, 1887. There has been nothing done as yet in the direction of reducing the output of Scotch or Bessemer product, and no radical change for the better in prices is thought probable until something takes place in the relation of supply and demand.

The demand for Steel of some descriptions is fairly active, but the output is large, particularly in the instance of Rails, and prices therefore continue to be more or less irregular. Some North of England makers are said to have quoted lower than £3. 12/6 f.o.b. on large blocks for export.

It is rumored that a Scotch firm is about to undertake the manufacture of Steel Plates at the Wear Rolling Mills, which have been standing idle for about three years.

Messrs. Adams & Sons and the Messrs. Parkes, both of Wolverhampton are erecting new Sheet-Iron mills.

The dispute between workmen and proprietors at the Darlington steel works has been settled and work will be resumed there this week.

Some large Indian contracts for finished Iron and Steel have been given out during the past week.

Scotch Pig.— Values are a shade lower on makers' brands and business is still moderate.

No. 1 Coltness,	f.o.b.	Glasgow.	46/6
No. 1 Summerlee,	"	"	46/6
No. 1 Gartsherrie.	"	"	44/
No. 1 Langloan,	"	"	44 6
No. 1 Carnbroe,	"	"	39/
No. 1 Shotts,	"	at Leith	45/
No. 1 Glengarnock,	"	Ardrossan	43/
No. 1 Dalmellington,	"	"	39/
No. 1 Eglinton	"	"	38/

Steamer freights, Glasgow to New York, 5/; Liverpool to New York, 7/6.

Cleveland Pig.—The market has ruled steady, with a fair volume of business. Middlesboro', G. M. B., 33/6; No. 3 do., 31/3.

Bessemer Pig.—Prices are steadier and the demand is running fair. West Coast brands, mixed numbers, 42/, f.o.b.

Spiegeleisen.—A quiet market with former prices current. English 20 % quoted 77/6, f.o.b. N. W. England shipping point.

Steel Rails.—There is a steadier tone to the market and rather more demand. Standard sections quoted at £3. 16/3, f.o.b. at N. W. England shipping point Middlesboro' district about 2/6 @ 5/ less.

Steel Blooms.—The market weak and sales slow. We quote at £3. 11/3 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Prices rather weaker, but a fairly good business at the decline. Bessemer, 2½ x 2½ inch, £3. 15/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Demand slow and prices barely steady. Bessemer, £3. 13/9, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—The market quiet, but prices steady. Mild Steel No. 6 quoted at £5. 12/6, f.o.b. at N. W. England shipping point.

Old Rails.—Very little demand, and prices rather weak. Tees quoted at £2. 17/6 and Double Heads £2. 18/6 @ £3, c.i.f., New York.

Scrap Iron.—A dull market, and prices unchanged. Heavy Wrought at £2. 5/ @ £2. 10/, f.o.b.

Crop Ends.—The demand still moderate, and prices nominal. Bessemer quoted £2. 5/ @ £2. 7/6, f.o.b.

Tin Plate.—Prices are firmer and the demand is fairly active.

IC Charcoal, Allaway grade	15/ @ 15/6
IC Bessemer steel, Coke finish	13/ @ ..
IC Siemens " " "	13/3 @ 13/6
IC Coke, B. V. grade	13/ @ ....
Charcoal, Terne, Dean grade	12/6 @ 13/

Manufactured Iron.—The market is barely steady and quiet. We quote, f.o.b. Liverpool:

	£	s. d.		£	s. d.
Staff. Ord. Marked Bars	....		@	7	10 6
" Common "	5	5 0	@	5	7 6
" Bl'k Sheet, singles	6	5 0	@	6	10 0
Welsh Bars (f.o.b. Wales)	4	15 0	@	4	17 6

Tin.—There has been a very good business at the lower prices. Straits quoted at £83 spot, and £83. 10/ @ £84 for three months' futures.

Copper.—The market strong and fairly active. Chili Bars closed at £83. 2/6, spot, and £75. 10/ @ £78. 10/, three months' futures. Best Selected, £79 @ £80 nominal.

Lead.—Weak market with the demand slow. Soft Spanish £12. 2/6 at the close.

Spelter.—Sales light and prices rather weak. Silesian, ordinary, £16 @ £16. 5/ at the close.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	₩ lb	$0.10 @	$0.07
Light Copper	₩ lb,	..... @	.07
Copper Bottoms	₩ lb.	..... @	.07
Brass, Heavy	₩ lb,	..... @	.05
Brass, Light	₩ lb,	..... @	.05
Composition.	₩ lb,	.0.12 @	.10
Lead, Heavy	₩ lb,	.03½ @	.03¾
Tea Lead	₩ lb,	.... @	.03¾
Zinc	₩ lb,	.03 @	.03½
Wrought Iron	₩ ton,	16.00 @	.....
Light Iron	₩ ton	8.50 @	.....
Stove Plate Iron	₩ ton,	9.00 @	.....
Machinery Iron	₩ ton,	12.00 @	.....
Grate Bars	₩ ton	..... @	5.00
Old Rubber	₩ lb.	.02 @	.06
White No. 1	₩ lb,	.03¾ @	.04
White No. 2	₩ lb,	.01¾ @	.01¾
Canvas, Linen, No. 1	₩ lb,	.04 @	.04½
Canvas, Cotton, No. 1	₩ lb,	.04½ @	.04½
Canvas, No. 2	₩ lb,	.02½ @	.02½
Seconds	₩ lb,	.01 @	.01½
Soft Woolens	₩ lb,	.06½ @	.07
Mixed Rags	₩ lb,	.01 @	.01¼
Gunny Bagging, No. 1	₩ lb,	.02 @	.02½
Jute Butts	₩ lb,	.02 @	.02½
Book Stock	₩ lb,	.01¼ @	.01⅝
Newspapers	₩ lb,	.00⅞ @	.01⅛
Waste Paper	₩ lb,	.00¼ @	.00⅝
Hemp Twine	₩ lb,	.03 @	.03¼
Sisil Baling Rope	₩ lb.	.... @	.03½

Imports.

Iron and Steel.

	May 26 to June 4. Tons.	Jan. 1 to June 4. Tons.
Iron Ore: R. De Flores	800	4,217
Pig Iron: G. W. Stetson & Co	300	9 830
Naylor & Co	280	2,030
Crocker Bros	180	4,380
Jas. Williamson & Co	100	2,300
N. S. Bartlett	100	2,500
Spiegeleisen: Naylor & Co	536	3,275
Crocker Bros	50	1,374
Steel: W. F. Wagner	40	662
Montgomery & Co	17	38
C. F. Boker	14	98½
R. F. Downing & Co	7	157
R. H. Wolff & Co	6	233
F. S. Pilditch	4	220
C. W. Power	4	34
Chas. Hugill	3	134½
Steel Rods: Naylor & Co	974	8,523
Hy. Whittemore & Co	350	10,960
J. Abbott & Co	160	3,364
Cary & Moen	40	439
J. A. Roebling's Sons	23	879
Steel Sheets: Ogden & Wallace	30	116
C. F. Boker	20	20
Pierson & Co	20	440
M. Cohn	11	11
Lalance & G. Mfg. Company	8	380
Henderson Bros	5	5
Iron: J. Abbott & Co	15	968
Steel Forgings: Thos. Prosser & Son	100	2,173
Steel Blooms: Naylor & Co	280	280
Steel Billets: Naylor & Co	751	1,244
J. Abbott & Co	297	950
J. A. Roebling's Sons	126	244
Steel Bars: R. H. Wolff & Co	4	4
Steel Tubes: J. S. Leng & Co	7	24
Steel Tires: Page, Newell & Co		4
Steel Wire: J. A. Roebling's Sons	45	56
Steel Screw Rods: American Screw Company	240	240
Steel Wire Rope: Pierson &Co.	11	11
Steel Bbl. Hoops: J. S. Leng's Sons	210	210
Steel Nail Rods: J. Abbott & Co.	169	204
Old Spring Steel: Naylor & Co.	200	200
Galvanized S. Wire: E. S. Greeley & Co	15	15
Rivet Rods: J. Abbott & Co	201	1,157
J. A. Roebling's Sons	104	164
G Lundberg	46	211
Ferromanganese: C. L. Perkins	725	3,425
Naylor & Co	175	175
Iron Girders: W. H. Wallace & Co	35	209
R. F. Downing & Co	28	364
Rail Crop Ends: Naylor & Co.	20	20
Sheet Iron: T. B. Coddington & Co	25	627
R. R. Bars: Delaware & L. R. R.	350	350
Charcoal Iron; Muller, Schall & Co	2	18
Old Rails: Winter & Smillie	80	80

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co	15,375	212,933
Hy. Whittemore & Co	4,697	33,625
D. Van Dusen & Co	3,392	114.622
T. B. Coddington & Co	3,019	67,858
G. B. Morewood & Co	3,157	18,939
R. Crooks & Co	2.402	32,814
Pratt Mfg. Company	1,737	72,148
Central Stamping Company	1,494	10,095
S. Shepard & Co	1,344	7,667
Merchant & Co	1,285	4,611
N. L. Cort & Co	1,248	47,151
James Byrne & Son	1,200	19,403
Bruce & Cook	827	37,058
Consolidated F. Jar Company	648	1,497
Lombard, Ayres & Co	500	3,928
A. A. Thomsen & Co	250	46,632
C. S. Mersick & Co	91	3,953

Hardware, Machinery, &c.

Barbour Bros. & Co., Mach'y, cs., 2
Boker, Hermann & Co., Mdse., cs., 16; Arms, cs., 16
Folsom, H. & D., Mdse., cs., 4; Arms, cs., 44
Field, Alfred, & Co., Arms cs., 14
Foley, Edward, Mach'y, pkgs., 11
Funch, Edye & Co., Hdw., case, 1
Graef Cutlery Company, Chains, cks., 20; Hdw., case, 1; Mdse, cs., 5
Gurney, F. B., Mdse., cs., 6
Hoe, R. & Co., Mdse., case. 1
Imhauer, ——, Mach'y, cs., 2
Kastor, A., Mdse., cs., 6
Korting Gas Engine Company, Mach'y, cs., 16
Merchants' Despatch Company, Arms, cs., 11
Newton & Shipman, Files, cks., 2
Powell & Clement, Arms, cs., 2
Schoverling, A., Mdse., cs., 50
Sellers, W. B., Mdse., cs., 3
Vom Cleff & Co., Ironware, cs., 11; Mdse., cs., 7
Webb, J Seares, Boiler Flues, 2
Wiebusch & Hilger, Lim., Mdse, cs., 6; Arms, cs., 16
Order, Machinery for Mexico, cs., 16; Hdw., cs., 2; Mach'y cs., 43; Wire Goods, bdls., 474; Bridgework for Mexico

Metals.

	Pounds.	Pounds.
Tin: A. A. Thomsen & Co	x2,289	44,798
Jas. E. Pope, Jr	114,418	114,418
Muller, Schall & Co	1,101,221	2,913,549
Bidwell & French	57,344	87,344
Naylor & Co	67,006	792,062
	Casks.	Casks.
Antimony: Phelps, Dodge & Co	30	380
American Metal Company	20	70

Irons and Metals Warehoused From May 26 to June 4, inclusive: Tons.

Steel Rods: S. A. Gilpin 172

The furnacemen and miners in the employ of the Dayton Coal and Iron Company, in East Tennessee, have quietly accepted the 10 per cent. reduction in their wages on the 1st of the month.

The boiler explosion at the Eureka Iron and Steel Works, Detroit, on the 1st inst., will prevent the company from filling

orders for plates until the end of the month, by which time repairs will be completed. The manufacture of bars and angles was not interfered with by the unfortunate accident.

The Western Scales.

The Wages Scale Committee of the Amalgamated Association met in Pittsburgh last week for the purpose of preparing the annual scale, to go into effect on July 1 next. At this writing the new scale has not been finished, but it is expected to be completed and ready for presentation to the manufacturers not later than Friday of the present week. As near as can be learned, the new scale will not differ materially from the one now in force, the few changes made being of minor importance. The same rate for boiling, viz., $5.50 per ton on a 2-cent card, will be demanded by the new scale, but from what can be learned this will be refused by the manufacturers. As is well known, the manufacturers granted an advance of 50 cents per ton for puddling last year, and it is reliably reported that they will endeavor to have the scale reduced this year to the old rate of $5 per ton for boiling on a 2-cent card. However, as neither the manufacturers nor the committee of the Amalgamated Association have their scales completed, it is, of course, impossible to state definitely what changes the respective scales will demand.

The recent reductions made in a number of the large steel establishments at Pittsburgh, within the last few weeks, are being taken as evidence that the iron manufacturers will also demand a considerable reduction when the two committees come together. In conversation with a representative of one of the Pittsburgh newspapers, recently, a large manufacturer expressed his views on the situation as follows: "I am not on the Scale Committee and do not know what that body may do, but I think a move is in contemplation to reduce wages in a roundabout way. Instead of proposing a straight reduction of 10 or 15 per cent., they will reduce the minimum of the card rate. At present the minimum is 2 cents for bar iron, upon which base the rate for boiling is now $5.50. According to the rules we cannot go below 2 cents, and it makes no difference how low the price of bar iron gets, we have to pay the same wages. Mind you, the 2-cent rate is not the actual selling price for iron under any rules of the association. Each member is allowed to sell his iron just for whatever it will bring, and if he sells it for 1 cent he has to stand the loss. The 2-cent rate is but the basing price. When the price of bar iron is based on a $2\frac{1}{10}$-cent rate the wages to be paid for boiling increases to $5.60 per ton. For every one-tenth of a cent the card advances wages go up 10 cents per ton, but the rate for boiling cannot be made less than $5.50. In flush times—during the war—I have seen the minimum card base go as high as 8 cents. The idea among a number of manufacturers is to reduce the minimum of the card from 2 to $1\frac{1}{2}$ or $1\frac{3}{4}$ cents. If the scale would slide both ways, and the rule making the minimum 2 cents was withdrawn, the price of boiling would be reduced to $5, provided the minimum was made $1\frac{1}{2}$ cents. I think this plan is what will be agreed upon. The Scale Committee meets next week, and I know of several of the members who will agitate the above idea."

Through Hon. G. W. Crouse, of Ohio, a petition has been presented to the House by wire drawers and manufacturers in favor of a reduction of duty on wire rods. It was referred to the Committee on Ways and Means.

Hardware.

The volume of general business is referred to as fair for the season, local and near-by trade being alluded to as constituting more than its proportion of the business. Assorted orders from the West are, however, coming in fairly, seasonable specialties being in good demand. There are comparatively few changes in price, manufacturers awaiting further developments of the market. The general tone is not strong, and it is anticipated that if the present tendency in raw materials continues there will be reduced prices in a good many leading lines.

Barb Wire.

Prices in this market are well maintained, with fair volume of business. Quotations remain 4 cents, carload lots, 4.15 cents for 3-ton lots and 4.30 cents for small parcels. The influence of the lower prices that prevail in the West is felt to some extent.

Wire Nails.

The market is characterized by more or less irregularity, and there is some divergence in the quotations made by different manufacturers. Carload lots, at factory, may be quoted $2.55 to $2.65, with about the usual advances for small lots.

Cut Nails.

The New York market shows no marked change, except that the distribution is reported to be improving under the impetus of more seasonable weather, which has at last allowed of continuous outdoor work. Prices remain $1.90 for carload lots on dock, and $1.95 to $2 from store for all standard brands of Iron Nails. Steel Nails command about 5 cents more per keg and under some circumstances 10 cents.

A joint meeting of committees from the Western Nail Manufacturers and the Atlantic States Nail Association was held in the Monongahela House, at Pittsburgh, on Thursday, the 31st ult. The first-named were represented by Walter Chess, of Chess, Cook & Co., Pittsburgh, Pa.; J. D. Du Bois, of the Belmont Nail Company, Wheeling, W. Va., and James Wilson, of the Bellaire Nail Works, of Bellaire, Ohio. The Eastern association was represented by Horace P. Tobey, of the Tremont Nail Company, West Wareham, Mass.; Arthur B. Clark, of the Old Dominion Iron and Nail Works Company, Richmond, Va., and John M. Reeves, of the Cumberland Nail and Iron Company, Bridgeton, N. J. The object of the meeting was to endeavor to arrange a uniform classification of extras on Cut Nails. The new classification adopted by the Western manufacturers, in April last, and which was to go into effect on the 1st inst., has not been put in force as proposed, the committees having adopted a new classification, which is expected to be satisfactory to both organizations. It is stated on good authority that the two schedules are now very close together. Meetings of the Eastern and Western manufacturers are being held to-day at Philadelphia and Pittsburgh.

Miscellaneous Prices.

Since our last report there have been no important open developments in regard to Ammunition, the situation remaining apparently substantially as before. The impression prevails in some quarters that the policy of the association of purchasing as rapidly as possible the stock of Cartridges in the hands of the Meacham Company is being successfully carried out, and it is intimated that trade is not likely to be long troubled by offerings of any considerable quantity of Cartridges at cut prices. This, however, is a matter concerning which no definite information is yet obtainable. The Meacham Company have made an announcement of their desire to unite with other houses in forming a new Cartridge company, and state that they are in communication with a well-known Fire-Arms manufacturer who has extra power and room for making Cartridges. They also state that they can obtain as superintendent an experienced party, and that skilled labor can be procured. They add that they are disposed to invest $25,000 in a new company and that they will join ten others with this end in view. This announcement is regarded by many as made principally for effect, but as referring to a project which has at different times been contemplated it is thought by others that there may possibly be something in it. While there is thus no material change in the situation, the trade, especially the large houses, are watching the course of events with interest, and awaiting developments. Some of the largest dealers while regarding the outcome of the matter as uncertain, and rather inclining to the belief that the association will succeed in preventing the Meacham Company from obtaining sufficient supplies of Cartridges, are apprehending that prices may before very long be lower than at present, and recommend caution in laying in stocks.

There has been a decline in Sisal Rope, the quotations of which have fallen off $\frac{1}{4}$ cent per pound Manila is, however, strong and prices firmly maintained.

The price of Shot in this market is unchanged, but lower quotations are made in the West. There is, however, considerable uncertainty in regard to the future course of the market and manufacturers are unwilling to accept orders for future delivery. The impression seems to prevail that Shot is likely to be lower, but this, of course, depends upon the course of the Lead market, concerning which no definite prognostications can be made.

Steel Squares are somewhat irregular in price and concessions by manufacturers are reported. There is also an evident disposition on the part of jobbers to sell them at somewhat lower figures.

There is a good deal of complaint in regard to the demand for Locks, and trade is sluggish, with a tendency toward lower prices. Concessions are more freely made to small buyers.

The association of Carriage Bolt manufacturers held their meeting last week. Their attention was occupied mainly with routine business and the details of their organization, which are not of public interest.

The following are the prices to the trade of Colt's Revolving Pistols, Magazine Rifles and Shotguns, manufactured by Colt's Patent Firearms Mfg. Company, Hartford, Conn. In addition to the information given in regard to prices, these quotations will be of service to the trade as enumerating the important Arms thus put on the market:

Pistols Furnished Blued or Nickeled, with Wood or Rubber Stocks.

Double-Action Army, .44 to .45 caliber, all lengths	$13.00
Double Action, .41 caliber, all lengths	11.30
" " .38 " " "	10.00
Single " Army, .45 caliber, "Peacemaker," all lengths	12.00
Single-Action Army, .44 caliber, "Frontier," all lengths	12.00
New Line, .41 caliber, blued or nickeled	4.00
" " .32 " " "	4.00
" " .30 " " "	3.25
" " .22 by the hundred, half or full plate	2.10
Old Model, .22 caliber, by the hundred, half or full plate	1.65
Colt Deringer, .41 caliber, per pair, half or full plate	5.50

National Deringers, .41 caliber, per pair, half or full plate	4 00
New House, .41 or .38 caliber, blued or nickeled	5.00
New Police, .38 caliber, 6 in., blued or nickeled	$7.00
New Police, .38 caliber, 4½ in., blued or nickeled	7.00

Magazine Rifles.

.40, .60 and larger caliber, including 38-56, 40-60, 45-60, 45-85, octagon barrel	$15.38
.40, .60 and larger caliber, round "	14.25
" " " " " carbine	14.25
" " " " " baby carbine	14.25
50-95 " Express," octagon	18.00
" " round	16.88
.32, .38 and 44 calibers, octagon barrel	13.50
" " " " " round "	12.38
" " " " " carbine	12.38
.22 caliber, octagon barrel	15.38
" " round "	14.25

Double-Barreled Shotguns; Hammerless Guns, 10 and 12 Gauges.

Damascus Barrels, No. 1 Grade	$60.00
" " " 2 "	93.75

The Salem Nail Company, A. Nelson, 295 Pearl street, New York, under date June 1, makes the following quotations on Roofing, Barrel and other special Nails, Slaters' Tools, &c.:

Refined Iron Slate and Tin Roofing Nails, per keg 100 pounds.

	Black.	Tinned.	Galvanized.
¾ and ⅞ inch	$4.75	$6.50	$6.25
1 and 1⅛ inch	4.00	5.75	5.50
1¼ and 1⅜ inch	3.75	5.00	4.75
1½ inch	3.25	4.75	4.50
1¾ and 2 inch	3 15	4.75	4.50

Wire, Slate and Tin-Roofing Nails.

	Black.	Tinned.	Galvanized.
¾ and ⅞ inch	$6.00	$7.50	$7.00
1 inch	5.00	7.00	6.50
1¼ inch	4.75	6.75	6.25
1½ inch	4.50	6.50	6.00

Less 10 cents per keg discount.

Copper Slate Nails, 3d. to 6d.	24 cts. ℔ lb.
Comp. or Yellow Metal Slate Nails, 3d. and 4d	22 cts. ℔ lb.
Zinc Slate Nails, 3d. and 4d.	12 cts. ℔ lb.
Lead Slate Nails	12 cts. ℔ lb.

Barrel Nails.

¾	⅞	1	1⅛ inch.
$4.75	$4.75	$4.00	$4.00 per keg.

Copper Nails, ¾ to 6 inch	25 cts. ℔ lb.
Copper Tacks, ½ to 1½ inch	26 cts. ℔ lb.
Zinc Tacks, ⅞ and 1 inch	12 cts. ℔ lb.

Lath Nails—3d. Fine.

Cut with grain and blued.....$3.50 ℔ keg.
We wish to call your special attention to our

Slate Roofers' Tools.

Slaters' Hammer	$3.00
" Knife or Axe	2.50
" Ripper	1.75
" Bench Stake	1.00
" Roof Stake	.75
Price per set of 5 Tools	8.50

Less discount.

They also quote 3d. Fine or Lath Nails, cut with grain and blued, at $3.50 per keg, and state that they have given up manufacturing Cigar Box Nails. They have a few kegs on hand of ¾ inch Swedes Iron Nails, of which they are sending out samples, on which they quote a special price.

The following are the list prices on the Andrus Sash Balance, made by the Andrus Mfg. Company, Rochester, N. Y., which are subject to a discount of 25 per cent.:

Per Set of 4 Balances for 2 Sash.

No.	Weight of sash.	Hight of sash not to exceed	
1	4 to 9 pounds	30 inches	$1.25
2	9 to 13 pounds	30 to 36 inches	1.40
3	13 to 17 pounds	40 to 46 inches	1.65
4	17 to 21 pounds	50 to 54 inches	1.90
5	21 to 27 pounds	54 to 60 inches	2.25
6	27 to 35 pounds	60 inches	2.50
7	35 to 40 pounds	60 inches	2.75
8	40 to 45 pounds	60 inches	3.00
9	45 to 50 pounds		3.25
10	50 to 60 pounds		3.50

The following are their list prices on Sash Locks, Door Bolts and other specialties, which are subject to a discount of 60 per cent.:

The Rose Sash Lock.—Large Size.

No.		Per doz.
100	Plain Iron, bronzed	$4.00
101	Iron bronzed, polished bronze Knob	8.00
102	Plain real bronze metal, polished	18.00
103	Plain real bronze metal, pol'd, dark	18.00

Ogee Tip, Ornamental.

No.		Per doz.
105	Iron bronze	$1.40
107	Iron bronze, nickel-plated Knob	2.25
109	Iron bronze, bronze-metal Knob	2.25
111	Iron polished, bronzed, bronze-metal Knob	2.75
113	Real bronze metal, No. 1 finish	7.50
115	Real bronze metal, No. 3 finish	7.50

Plain Finish.

No.		Per doz.
120	Bell tip, iron, bronzed	$1.50
122	Bell tip, iron, bronzed, bronze-metal Knob	2.75
124	Bell tip, real bronze metal, polished	8.00
126	Bell tip, real bronze metal, nickel-plated	10.00
128	Ogee tip, real bronze metal, polished,	7.50
130	Ogee tip, real bronze metal, nickel-plated	9.50

Bell Tip, Ornamental.

No.		Per doz.
132	Iron bronzed	$1.50
134	Iron bronzed, nickel-plated Knob	2.75
136	Iron bronzed, bronze-metal Knob	2.75
138	Iron polished, bronze plated	4.75
140	Real bronze, No. 1 finish	8.00
142	Real bronze, No. 3 finish	8.00

Rose Door Bolt.

No.		Per gross.
70	Ornamental, iron bronzed	$40.00
72	Ornamental, real bronze metal	52.00
74	Plain, real bronze metal	58.00
76	Plain, real bronze metal, nickel-plated	60.00

Rose Ventilating Window Sash Lock.

No.		Per doz.
10	Ornamental, malleable iron bronzed	$1.20
12	Malleable iron, polished face, bronzed,	1.40
15	Malleable iron, bronze, nickel-plated face	1.80
20	Bronze metal, plain	3.50
25	Bronze metal, No. 1 finish	3.50
28	Bronze metal, No. 3 finish	3.50
30	Bronze metal, nickel-plated	3.60

Shutter Bars.

No.		Per doz.
78	2 inch Iron bronzed	$1.00
80	2½ inch Iron bronzed	1.15
82	2 inch Iron Bronze plated	1.75
84	2½ inch Iron Bronze plated	1.90
86	2 inch Real Bronze, No. 3 finish	4.00
88	2½ inch Real Bronze, No. 3 finish	4.25
90	2 inch Real Bronze, plain	4.50
92	2½ inch Real Bronze, plain	5.00

Shutter Knob.

94	1 inch Iron bronzed	.40
96	1 inch Iron Bronze plated	1.00
98	1 inch Real Bronze, No. 3 finish	1.50
100	1 inch Real Bronze, plain	2.00

Sash Lifts.

102	Iron, bronzed	.40
104	Iron, bronze-plated	.85
106	Real bronze, No. 1 finish	2.00
108	Real bronze, No. 3 finish	2.00
110	Real bronze, plain	2.50
111	Real bronze, plain, nickel-plated	3.00

Upper Sash Socket.

113	Berlin bronzed	.55
115	Nickel-plated	3.00
117	Bronze metal, plain	2.50
119	Bronze metal, No. 1 finish	2.50
121	Bronze metal, No. 3 finish	2.50

Flush Sash Lifts.

125	Iron, bronzed	.85
127	Iron, bronze-plated	1.50
129	Real bronze, No. 3 finish	5.50
131	Real bronze, plain	6.00
133	Real bronze, plain, nickel-plated	7.50

Plows.

The Northwestern Plow Manufacturers' Association held a very important meeting at the Grand Pacific Hotel, Chicago, on Tuesday and Wednesday of last week. On discussing the situation and prospects for the coming season, it was determined that it would be inexpedient to attempt to maintain prices, which would inure largely to the benefit of a few prominent concerns operating independently, as well as a number of small establishments manufacturing for local trade. A reduction of 10 per cent. was at first approved, as it was believed that the price thus made would put all manufacturers on an even basis for business, affording no margin for cutting and preventing the enlargement of facilities which it was understood some of the outside manufacturers were contemplating. Upon further discussion, however, it was agreed that no restriction whatever should be placed upon the members of the association, but that they should be permitted to make such prices as circumstances warranted. The result of this action cannot be forecast. Another meeting of the association will be held in August. Possibly by that time manufacturers heretofore indifferent or hostile to the association may conclude to unite with it and assist in maintaining prices. On the other hand, influences may develop which will cause the manufacturers to drift wider apart than ever. The association meanwhile will be held together by agreement of the members. The action just taken does not mean a disruption or a dissolution, the constitution of the association providing for such a contingency as this, among others. During the meeting the attitude of the Steel syndicate was discussed, and some bitterness was expressed at the very high rate which had been fixed for the material they furnish. The fact was recognized fully that for two years the Steel manufacturers had probably lost money in competing with one another for this trade, but it was said they should have been satisfied with a smaller advance than they made when the syndicate was reorganized. Contracts for Steel for the coming season will be made in July, and very few of the Plow manufacturers are reported to have stocks of this material of any consequence. An effort will be made to have the price reduced in view of the very unsatisfactory condition of the Plow trade.

Items.

Morley Bros., East Saginaw, Mich., are manifesting characteristic enterprise in giving to their customers and putting within the reach of the trade generally a line of price lists intended for use in retail stores. These price lists, which are of different sizes, as mentioned below, are printed on heavy card, and contain a designation of the leading goods to which they relate, with the list prices, and blank spaces for noting the cost and the selling price, the cards being furnished with an eyelet, by which they can be hung up where desired. Some of the cards, as, for example, those devoted to Window Glass, Sash Doors and Blinds, Iron and Steel and Horse and Mule Shoes, contain tables, which embody considerable information relating to these lines, which will be serviceable to the trade, given as it is in this accessible form. A complete set of these price lists comprises the following, which are of the dimensions mentioned:

Wood Screws	7¼ x 14 inches
Carriage Bolts	7¼ x 14 inches
Machine Bolts	7¼ x 14 inches
Stove Bolts	3½ x 14 inches
Plow Bolts	7¼ x 14 inches
Tire Bolts	7¼ x 14 inches
Strap and T Hinges	3½ x 14 inches
Tinware—Stamped and Pieced	6⅛ x 22 inches
Window Glass	5½ x 18½ inches
Sash, Doors and Blinds	5½ x 18½ inches
Bar Iron and Steel	5½ x 18½ inches
Horse and Mule Shoes, Toe Calks and Cut Nails	5½ x 18½ inches

These price lists, as intimated above, are furnished, without charge, to their customers and are offered to the trade generally at $2 per set.

On page 52 will be found an illustration of the extensive Lithographing, Printing and Engraving establishment of Gies & Co., Buffalo, N. Y. This well-known house makes a specialty of printing Catalogues, Price Lists, Posters and other trade matter, and possesses exceptional facilities for doing it promptly, to the best advantage and in the best manner.

The Field Force Pump Company, Lockport, N. Y., issue an eight-page leaflet devoted to Spraying Nozzles, of which an interesting variety are illustrated.

McIntosh, Huntington & Co., Cleveland, Ohio, have sent out a considerable budget of extra pages, corrections, new pages, &c., for insertion in their catalogue. A

considerable portion of this matter relates to specialties, new goods, &c. An interesting addition is thus made to their very complete volume.

In different parts of the West there is a marked tendency toward the adoption of Wire Picket Fence. At Flint, Mich., there are two or three manufacturers of Wire Picket Fence machines, and they are reported to have had an excellent trade, selling from 25 to 40 machines per week.

On Wednesday of next week, June 13, C. Cowles & Co., New Haven, Conn., will celebrate the semi-centennial of the organization of their house. It is expected that the officers, directors and the employees of the company will participate in a banquet, when there will be speeches and reminiscences of the 50 years during which the firm have conducted business, with other appropriate exercises.

The revised price list of the Grilley Company, New Haven, Conn., to which we referred in a recent issue, and which bears date May, 1888, is exceptionally full and complete. It represents the recent additions to their line and illustrates the different goods they are manufacturing. It thus covers Silver, Brass and Bronze Patent Capped Screws, Nickel and Silver Plated Screws, Porcelain Picture Knobs, Picture Hooks, Picture Nails, Pad Screws, Water Hook Bolts, &c.

We are advised by the A. F. Pike Mfg. Company, Pike Station, N. H., that a decision has been rendered in their suit agaist the Cleveland Stone Company, and that injunctions have been granted against the latter company, enjoining them from using the trade-marks concerned in the litigation.

Stiles Frost, 187 Devonshire street, Boston, Mass., who is widely known as manufacturer of Thill Springs and other specialties, is putting on the market a Bottle Mailing Case, which consists of a round wooden box with a screw top, and inside this case the bottle is placed. This simple novelty is especially adapted for liquids, by having a thick lining of some absorbent material, which in case of breakage—which, however, with its use is not liable to occur—will quickly absorb the liquid and prevent damage to articles with which it might come in contact. A number of different sizes are made.

The Livingston Nail Company, 104 Reade street, New York, have issued a circular in which they give a cut of one of their Western Horse Nail boxes showing the brand which it bears. In regard to this they say:

We have used this brand for many years, and having gained for it a deserved popularity are now compelled to issue this notice to protect the trade and ourselves against a company who make cheap Nails and who have been making and sending out an inferior quality of Horse Nails branded Western. We trust by this means to counteract any bad effect the imitation may have caused and to assure the trade that we shall protect this brand against any further piracy from any source.

W. K. Morrison & Co., Belfast, Me., have sold out their Hardware business to A. C. Burgess, who will consolidate his stock with theirs, continuing in the former store. This store is 30 x 150 feet, and is alluded to as one of the best arranged in the city. Mr. Morrison thus retires from business in Belfast that he may engage in it more extensively in Minneapolis, where he has made arrangements with Janney, Semple & Co., widely known as prominent Hardware merchants, to take their retail business at their present quarters, 107 Nicolett avenue, while they occupy their new quarters at First avenue, South and Second streets, where they will carry on a strictly wholesale business with increased facilities. The style of the retail house will be W. K. Morrison & Co., Incorporated, with a capital stock of $100,000, Mr. Morison being president and general manager. It is expected that the above change will be made between July 15 and August 1. The trade will note with satisfaction these changes, looking, as they do, to enlarged business enterprise.

In another part of this issue E. C. Stearns & Co., Syracuse, N. Y., present an illustration of their Improved Bench Drill with adjustable bed plate. This feature, which has lately been added, is regarded by the manufacturers as an important improvement.

An interesting game of base ball was played at Schuetzen Park, Union Hill, N. J., on Saturday, June 2, between a picked nine from the importing houses of Wiebusch & Hilger (Limited), A. Field & Co. and F. & W. Clatworthy, and one composed exclusively of Hermann Boker & Co.'s men. Many friends of the opposing teams went over to witness the contest and were fully repaid for the trip. The game was umpired by Mr. Massigani, of College Point, whose impartial decisions gave full satisfaction. The superior batting of the Boker team won the game, the score by innings being as follows:

	1	2	3	4	5	6	7	8	9	
Wiebusch & Hilger.. A. Field & Co..... F. & W. Clatworthy	1	0	0	2	0	0	0	0	0	—3
H. Boker & Co.....	2	3	1	5	5	1	8	6		—31

The trade will observe on page 65 the advertisement of John T. Starr, Coldwater, Mich., in which he calls attention to the lines in which he is specially interested and on which he is in a position to offer inducements to his customers.

Clauss Shear Company, Fremont, Ohio, who manufacture a line of Shears and Scissors, issue a combined list and order sheet, making a quotation to the general trade of 60 per cent. on Nickeled and 70 per cent. on Japanned, the list being the same in both cases.

A recent issue of the Pittsburgh *Dispatch* contains the following review of the Hardware trade of that city, with reference also to other markets:

A leading Hardware dealer of the city, who returned recently from an extensive Eastern trip, reports that he met everywhere with discouraging accounts of the spring trade in his line. In the course of his travels a large number of Hardware dealers from the West were encountered, and, with scarcely an exception, the reports proved a large decline in trade in all sections as compared with the spring of 1887. The impression received by this Pittsburgh dealer, who was born to the trade and knows it through and through, was that no city in the land can present a better showing for the spring trade in Hardware than our own. One old-time dealer reports a slight falling off in trade; another says the volume of his business has been larger and margins closer than any previous season. This increase has cost not a little expenditure of energy on the part of drummers, who are everywhere pushing Pittsburgh Hardware in the markets. While the Hardware trade here has probably held up as well as at any trade center of the country the present season, and, in exceptional cases, will compare favorably with former years, there is no doubt that as a whole the volume of business has been slightly below that of 1887.

In their advertisement on page 73 it will be seen that John H. Graham & Co., 113 Chambers street, New York, illustrate the Ives Sash Lock, for the sale of which they are agents. They also allude to the Ives Mortise Bolts.

The Bromwell Brush and Wire Goods Company, Cincinnati, Ohio, have issued for the current year their sixty-ninth annual catalogue. It is a pamphlet similiar to their last issue, and devotes 150 pages to the exhibition of their line of goods, including an extensive variety of Wire Goods, Brushes, &c. It is accompanied by a discount sheet, in which prices are given on the different lines. Attention is called to the new list on Split Turkey Feather Dusters and to the uniform scale of discounts based upon quantities, qualities and sizes of Dusters desired, which has been adopted by the different manufacturers. In order to be entitled to the outside discounts orders must average a list price of $6.50 per dozen or upward. By this arrangement it is pointed out that an excessive proportion of the low-priced goods would materially increase the cost of the goods, and it is therefore suggested that purchasers make their orders run fairly to the large sizes, in order to insure the lowest prices. Orders under 25 dozen are sold at a decreasing scale of discounts.

L. & I. J. White, Buffalo, N. Y., have a new catalogue in the printers' hands, which it is expected will be issued early in July. With their increased facilities they are enabled to fill their orders with dispatch.

The American Mfg. Company, Philadelphia, issue a circular in which they refer to the recent advertisements of the Enterprise Mfg. Company, announcing that they have secured an injunction against the American Machine Company, as having been by some of their customers misunderstood as relating to the American Mfg. Company. They state that their company has not been enjoined from selling the Great American Meat Cutter, which they are advised by their counsel does not infringe the Enterprise Company's patents.

The trade will observe on page 57 an announcement signed "P. B. H.," of a Hardware business which is offered for sale. This opportunity is deserving the attention of the trade, the business being referred to as long established in a leading Indiana city, with a well-assorted stock and opportunities for considerably increasing the trade.

The Salem Wire Nail Company, Salem, Ohio, have discontinued their branch office, 166 Lake street, Chicago, and the services of M. A. Mihills, and have instead appointed E. C. Brainard, their general traveling salesman. This change goes into effect at once, and inquiries for prices should be hereafter sent to the company at Salem, Ohio.

Whitfield & Jacobs, Pontiac, Mich., are manufacturing the Buckell Safety Clevis, of which we gave an illustrated description some time ago. The firm is composed of J. B. Whitfield and Jacobs Bros., Hardware merchants in Pontiac. They have increased their facilities for manufacturing these Clevises, so that they are able to turn out more goods, and of a more uniform quality, the manufacture being given their careful personal supervision. Some improvements in minor details have also been made in the goods. They have brought out a new Clevis this season which is designated as No. 2, the swivel hook of which is intended to catch directly on to the link of any ordinary sized chain, as well as to any farm tool. They have made arrangements with Standart Bros., Detroit, Mich., to supply the trade in Michigan, while they are devoting their time to introducing the goods in other sections.

A. F. Seeberger & Co., wholesale Hardware merchants, 38 and 40 Lake street, Chicago, are making extensive alterations in their store building. They have taken possession of the second floor, formerly rented to Rathbone, Sard & Co., and have installed in it their cutlery and sporting goods department, which is now being made a prominent feature of their business. Room has thus been obtained on the first floor which has been badly needed for years to accommodate the clerical force. When all the improvements now under way are completed, this establishment will present a very handsome appearance.

Arrangement of Stores.

We have had several inquiries from Hardware merchants in regard to the best method of sampling Cutlery, and also of attaching the samples to the boxes in which the goods are contained. The illustration, Fig. 230 given above, represents a device which is put on the market by Hermann Boker & Co., 101 Duane street, New York. As will be inferred from the cut, Fig. 230, these boxes have a spring inside which operates the clamp by which the knife or other article is held in place, there being an opening in the side of the box through which the finger is inserted in order to release the pressure of the spring when it is desired to remove the sample. In this way it is obvious that the sample is securely held and readily removed or changed when desired. The boxes are made of suitable size to contain the stock of the Knives, and are well constructed and neatly finished. They are made regularly of the following sizes:

	Hight.	Width.	Length.
Ladies' Knives	3⅛	2¼	5 inches.
Pocket Knives	4¼	3⅛	5 "
Razors	7	3	4¾ "

Special sizes are made to order. Besides the advantages referred to above as possessed by this device it is pointed out that with the use of these boxes the stock is very easily kept in order. It is found desirable to have a strip fastened on the shelf at such a distance that the front of the boxes is flush with the edge of the shelf, the goods thus presenting an attractive appearance, and not being liable to be disarranged in handling. The additional stock or other goods which it is desired so to accommodate can be kept in the space behind the boxes. This method of accommodating Cutlery is in use in many leading stores, but there are many Hardware merchants throughout the country who are not familiar with it, and will doubtless be interested in the information thus given. These boxes are also sold to the trade by F. B. Gurney, 116 Chambers street, New York.

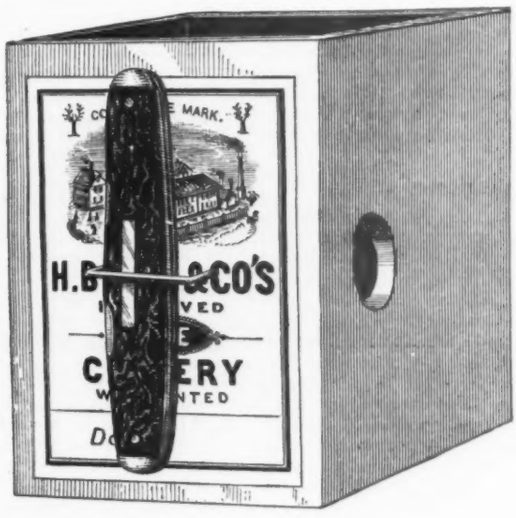


Fig. 230.—Gurney's Cutlery Boxes.

The Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, have a very compact method of keeping an assortment of Wire, which is illustrated in the accompanying cut, Fig. 231. The rack is in the shape of a counter, with a top 3 feet wide made of heavy plank. Below this divisions of inch boards have been inserted, extending the full width of the counter and open at both ends, allowing access from either side of the counter. The openings to these divisions are 26 inches high by 5 inches wide, these dimensions having been found most suitable for the usual Wire coils. Eighteen divisions are provided, this number being about right for the average stock of the proper assortment. An inch strip extends along the floor at the bottom of the divisions to prevent the Wire from rolling out. This method of keeping Wire to be sold at retail is found greatly preferable to the common practice of hanging the coils up. Full bundles can be kept elsewhere in stock. Tinners will find this an excellent plan, as the space under their tables can thus be utilized. The numbers and kinds of Wire can be painted on the board which extends along the upper part of the divisions. In an ordinary store the counter can be used for miscellaneous purposes, but will be found specially desirable for unorlling and cutting Wire Cloth.

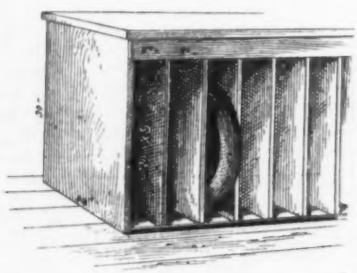


Fig. 231.—Wire Rack,

The accompanying illustration, Fig. 232, represents a sample card of Tacks, &c., as used by A. R. Thompson, Peoria, Ill. It illustrates his method of sampling these goods, noting retail price, &c. It represents the different kinds used in his locality, and the size of the card may obviously be increased or diminished to suit the requirements of any merchant. The card shown is 8 inches square. It is made of heavy cardboard, and samples are fastened on with black waxed double thread, as designated in the illustration. A small hole is made under the Tack or Brad, and the thread is passed over the sample and drawn tight, the head being sunk in the cardboard. The sample card is to be kept hanging near the Tacks, and is always to be shown to the customer to select from, as very few consumers understand what is

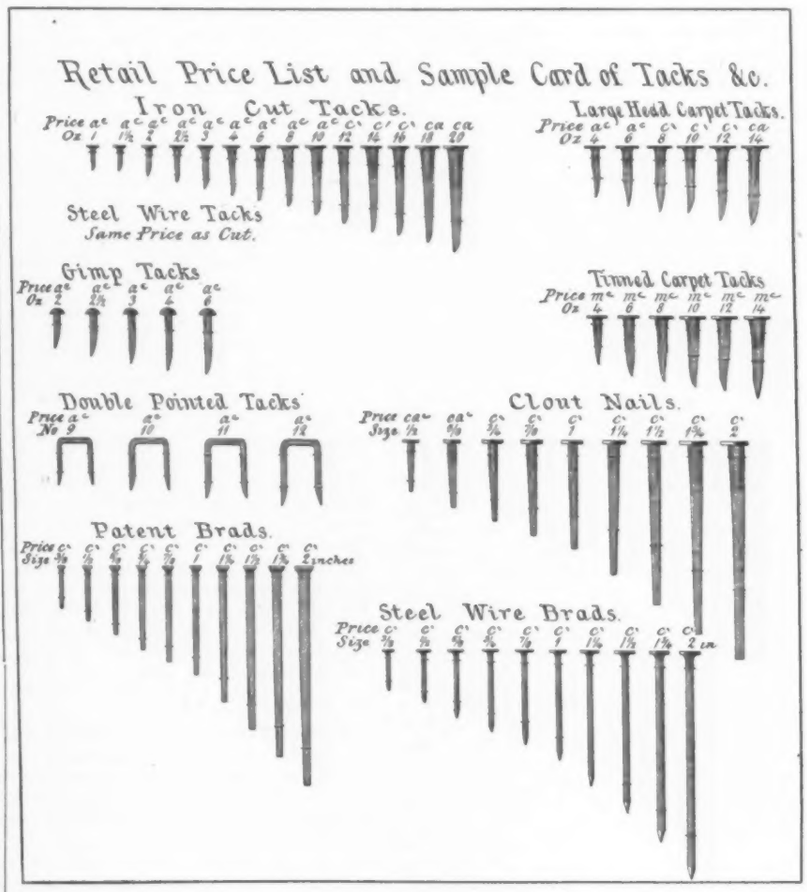


Fig. 232.—Sample Card of Tacks, &c.

meant when asked whether they want an 8-ounce or a 10-ounce Tack. Mr. Thompson reports that much time is saved by the use of this card, many customers remarking on its convenience. They quickly designate the size they want and the goods are given to them, the asking of questions or opening of packages to show sizes being thus avoided. The sample card will last for years if used properly, and should always be kept in place.

The following suggestions in regard to the arrangement of Hardware stores, with a view to the satisfactory display and storing of certain lines of goods, are from an English Hardwareman:

Cutlery should be kept in a glass case, which should be fixed in a prominent position, as nothing looks more attractive than a well-arranged display of Cutlery. For Table Cutlery, where the same numbers are adhered to in ordering from time to time, a series of wood boxes, placed upright, with the top end open and narrow side facing, large enough to take a set of each table and dessert, answer well, and when faced with glazed green paper and a knife of each size fixed on the front, they present a neat appearance.

The lower shelf may be made just wide enough to take packets of Pocket Knives, and, as most firms now send them out in cardboard boxes, these may be arranged in the same way, with a pattern of the contents tied outside each packet. If space will admit a row of Scissors may also be shown, either with packets placed upon a slightly slanting shelf, with a bead along the front to prevent them slipping, or a copper wire stretched across to keep the packets upright.

Screws for retailing in less than gross packets should be kept in a drawer (or a nest of shallow drawers), say 1½ feet deep, divided into compartments, to hold a gross of each of the most useful sizes. For the smaller sizes open tin boxes, to slip into the divisions, will be found handy, as they may be lifted out for serving.

The methods of managing catalogues, circulars, &c., which we have described have for the most part been on a pretty extensive scale and beyond the requirements of many retail Hardware merchants. We are therefore desirous of giving the trade information in regard to desirable methods of accommodating such price lists as are used by representative Hardwaremen doing a business of moderate extent, especially as some of our subscribers are inquiring for such information. The trade at large are apparently giving more attention to this matter than heretofore, recognizing the importance of having a system, and a good one, for taking care of the varied trade literature relating to prices in such a way that the list of a given manufacturer may be found without trouble, and such information in regard to the different lines of goods contained in such price lists be always accessible and within easy reach We therefore solicit from the trade information in regard to their methods in this important department of business. We shall be glad to have such illustrations prepared as will enable us to satisfactorily describe any desirable methods which may be reported to us. Such of our readers as have a good system for this purpose will be rendering a service to the trade by giving information in regard to it.

There are doubtless a good many Hardwaremen who have no such system, who would find it to their advantage to adopt one, that they might be the better posted in regard to goods and prices, and so be in a position to buy more intelligently and closely, and to effect many sales which, without such a system, they are not in a position to make.

As emphasizing this matter we lay before our readers the following request from a Southern house:

We would be pleased to be informed through *The Iron Age* in regard to the best and most convenient arrangement for keeping small catalogues and pamphlets, so arranged that it will be convenient to find the same when in need. Information on this point will greatly oblige a subscriber.

In answering this inquiry we would suggest that the trade advise us on the following points:

1. The method adopted for holding bound volumes and also for accommodating pamphlets, circulars and miscellaneous trade matter.

2. The method of indexing so as to facilitate reference to any line of goods represented in catalogues or price lists.

3. The method adopted for recording prices, quotations made by manufacturers or jobbers, and such changes as may from time to time occur.

Obituary.

James Renwick, for the past 18 years in the New York store of A. Field & Sons, 88 Chambers street, New York, died suddenly at his place of business, on Saturday last. He was talking with some business acquaintances when suddenly he fell forward and almost immediately expired. A physician was called, who pronounced the cause of death pulmonary hemorrhage. The deceased had been in poor health for some time. He was 45 years of age and had been married about two years. Mr. Renwick was an ex-member of the Twenty-third Regiment and a member of the Veteran Association of that organization. He was of a quiet but pleasant disposition and had a large circle of business acquaintances and personal friends, by whom he was held in high esteem. The funeral was held Monday evening, at his late residence, 664 Greene avenue, Brooklyn.

Trade Topics.

As bearing upon the controversy in regard to cases and cartage, to which reference has repeatedly been made in these columns, we give the following contribution, which relates, it will be seen, to an announcement made by a Connecticut house in regard to this matter:

The following resolution from the progressive and level-headed firm of Hull & Rogers, Hardware and Stove dealers, Danbury, Conn., has fallen into our hands:

Being engaged in manufacturing and jobbing, as well as retailing, we find that a majority of our customers will not pay the "packing and cartage" charges. Therefore, we have resolved not to make or pay any more such charges. The sooner all get into this way of dealing, the better it will be, especially for the retailer; he will then know just what his goods are to cost him. There are now plenty of manufacturers and jobbers in our line who are anxious to sell us goods on above terms. If you cannot do so, please let us know.

We consider it a step in the right direction. The retailer has his catalogue, price list and discount sheet to figure the cost of goods from; nothing is said in them about the cost of cases or carting. He orders the goods, and when invoice is received a charge for packing and cartage which many times amounts to 5 per cent. or more of the bill stares him in the face. He had not figured it into the cost. Many manufacturers and jobbers do not make these charges, and the sooner the others do away with them the better it will be for them. If their profits will not allow it then let them add a little to the price of the goods. There is no more reason for charging for wood cases or carting than there is in charging for paper boxes, wrapping paper, twine, shipping clerks' salary, &c. All goods, in our opinion, should be f.o.b.

In regard to the question as to the withdrawal of the warranty on Cross-Cut Saws and the trouble and expense to which manufacturers and merchants are necessarily put, we have the following communication from the N. W. Spaulding Saw Company, San Francisco, Cal.:

We have had some of these difficulties to contend with, but consider them more the fault of the seller than the consumer, all brought about by their reckless unbusiness-like scramble for trade, willing to concede everything, do anything and promise everything to get an order, whether the consumer wants a Saw or not. This makes the consumer their master, from whom they are compelled to submit to all kinds of injustice. It is only when we come in sharp competition that we have anything to complain of. There appears to be no other business where skill is required where the proprietor leaves so much of the details to others as does the manufacturer of lumber. If the user of Saws fails either by reason of his own incompetency or neglect to make a Saw do all that is expected of it, it is condemned much oftener when there is no fault with the Saw than otherwise, and it is returned to cover up his shortcomings. In cases where the seller has laid around the mill in person or by proxy, begging to be permitted to send Saws under any condition, either understood or imagined, what can he do but take his goods back and meekly submit.

On the same subject a correspondent in Michigan expresses himself in the following emphatic terms:

I have read with interest your correspondents' views on Cross Cut Saws, and I will say, and no manufacturer will dispute my assertion, that there are no good Saws on the market, and there have not been for the past six years. When I want a good Saw I send to a manufacturer and order one, and it seldom costs me less than $1 to $1.25 per foot, and I have paid as much as $2 per foot. Such Saws could be made and sold at retail at $1 per foot if there were a sufficient demand to have them made in quantities. They would do more work with less labor, and require about one-fourth as much filing. Saws should not be warranted against anything, but might be warranted Crucible Tool Steel. Very few men can fit a Saw properly and cannot learn, unless they have good plain instructions, from some one who understands the business. If manufacturers would give a card with each Saw giving the proper cuts and a full description of the teeth without advertising some "Jim Crow" Saw Set they would have less rusty Saws to regrind and refinish.

E. Windsor Richards.—Mr. E. Windsor Richards, who for the past 12 years or more has been the general manager of Bolckow, Vaughan & Co. resigned his position, the duties being too arduous, and accepted the position of managing director of the Low Moor Iron Works, near Bradford, at the same time being elected a director of Bolckow, Vaughan & Co. Mr. Richards is well known to American iron makers, having visited this country some years since. The directors of Bolckow, Vaughan & Co. have decided that Mr. Franklin Hilton, who for the last eight years has been the chief engineer and assistant general manager at their works, shall be appointed his successor. He began work when 16 years of age as an apprentice at the locomotive engineering works of the East Lancashire Railway Company, at Bury; afterward he held important positions at Messrs. Charles Cammell & Co., Sheffield; the West Cumberland Iron Company, Workington; the Rhimney Iron and Steel Company; and the Ebbw Vale Iron and Steel Company, South Wales. In the last-named place he was chief engineer under Mr. Windsor Richards, whom he now succeeds. Lieut.-Col. J. G. S. Davies, R. E., has been appointed the general secretary of the company Mr. Richards does not vacate his position until the end of the year.

The Stolberg Zinc Company produced last year 14,391 tons of Spelter, against 14,390 tons in 1886; 14,391 tons of Lead, against 14,390, and 52,070 kg. Silver, against 34,181. The company sold 11,542 tons of Spelter, 3692 tons of Sheet Zinc and 14,597 tons of Lead, together with the Silver extracted.

The employees of the National Tubular Axle Works, at McKeesport, Pa., were notified on Saturday night of a 10 per cent. reduction in wages.

CURRENT HARDWARE PRICES.

JUNE 6, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢
E. B. Trimmed Edge, 1-10's.....65¢
E. B. Ground Edge, Central Fire, 1-10's.70¢
Double Waterproof. 1-10's.....$1.40
} dis 25@ 25& 7½ %
Musket Waterproof, 1-10's.....52¢ @ 53¢
G. D.....28¢
S. B.....30¢
Union Metallic Cartridge Co.
F. C. Trimmed.....50¢
F. L. Ground.....65¢
Cen. Fire Group.....70¢
Double Waterproof.....$1.40
Double Waterproof, in 1-10's.....$1.40
} dis 25@ 25& 7½ %
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 56¢
Eley's D Waterproof, Central Fire.....$1.60

Cartridges—
Rim Fire Cartridges.....dis 50&5&2 %
Rim Fire Military Cartridges.....dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle...dis 25&5&2 %
Cen. Fire Cartr., Military & Sporting....dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal.....$1.75, dis 2 %
Blank Cartridges, 32 cal.....$3.50, dis 2 %
Primed Shells and Bullets.....dis 15&5&2 %
B. B. Caps, Round Ball.....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged.....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....$1.00, dis 2 %
All other Primers, all sizes.....$1.20 dis 2 %

Shells—
First quality. 4, 8, 10 and 12 gauge.....dis 25&10&2 %
First quality. 14, 16 and 20 gauge ($10 list).....dis 30&10&2 %
Star, Club, Rival and Climax Brands, } 10-gauge, $9 list } dis 33⅓&10 2 %
12 gauge, $8 list }
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....dis 30&10&2 %
Selbold's Combination Shot Shells.....dis 15&2 %
Brass shot Shells, 1st quality.....dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %

Shells Loaded—
List No. 19, 1887.....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up.....$2.00
U. M. C. & W. R. A.—B. E., 9&10.....2.30
U. M. C. & W. R. A.—B. E., 7&8.....2.60
U. M. C. & W. R. A.—P. E., 11 up.....3.10
U. M. C. & W. R. A—P. E., 9&10.....4.00
U. M. C. & W. R. A.—P. E., 7&8.....4.90
} dis 20&2 %
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11 @ 20.....$2.80

Anvils.—Eagle Anvils....₩ ℔ 10¢, dis 20 @ 20&5 %
Wright's.....9½¢
Armitage's Mouse Hole.....8½¢
Armitage Mouse Hole, Extra.....11½@11½¢
Trenton.....9½¢@9½¢
Wilkinson's.....9½¢@10¢
J. & Riley Carr. Patent Solid.....11@11½¢

Anvil Vise and Drill—
Millers Falls Co.....$18.00, dis 20 %
Chenev Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise.....$5, dis 40&10 %
Moore & Barnes Mfg. Co.....dis 33⅓ %

Augers and Bits.

Douglass Mfg. Co.
New Haven Copper Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher)
.....dis 70 %

Cook's, Douglass Mfg. Co.....dis 55 %
Cook's, New Haven Copper Co...dis 50&10&50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 10, extension l'p.....dis 40 %
C. E. Jennings & Co., No. 30.....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32½ quarters, No 5, $5; No. 3C, $2.....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings' Bits (new list).....dis 60@65&5 %
Pugh's Black.....dis 20 %
Car Bits.....dis 50&10&60 %
L'Hommedieu Car Bits.....dis 15&10 %
Forstner Pat. Auger Bits.....dis 10 %

Hollow Augers—
Ives
French, Swift & Co.
Douglass'.
} dis 25&10 @ 25&10&5 %
Bonney's Adjustable ₩ doz. $45.....dis 40&10 %
Stearns'.....dis 20&10 %
Ives' Expansive, each $4.50.....dis 50&10 %
Universal Expansive, each $4.50.....dis 20 %
Wood's.....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $26.....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60.....dis 35 @ 40 %
Swan's.....dis 40 %
Steer's, No. 1, $26; No. 2, $22.....dis 35 %
Stearns' No. 2, $48.....dis 20 %

Gimlet Bits—
Common.....₩ gross $2.75 @ $3.25
Diamond.....₩ doz. $1.10, dis 25&10 %
"Bee".....dis 25 @ 25&5 %
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co.....dis 30&10 %
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....dis 40&10 %
Double Cut, Ives'.....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Syracuse, for metal.....dis 50&10&5 %
Syracuse, for wood (wood list).....dis 30 @ 30&5 %
Williams' or Holt's, for metal.....dis 50&10&10 %
Williams' or Holt's, for wood.....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's.....dis 15&10 %
Watrous's.....dis 15&10 %
"Bell s".....dis 15&10 %
Snell's Ship Auger Pattern Car Bits.....dis 15&10 %

Awl Hafts.

Sewing, Brass Ferrule.....$3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short.....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₩ doz.—net
Patent Peg, Plain Top.....$10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top...$12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.

Awls, Sewing, Common.....₩ gross $1.70—dis 35 %
Awls, Shouldered Peg....₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg.....₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad.....$2.70 ₩ gross—dis 35 %
Awls, Handled Brad.....$7.50 ₩ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch.....$1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.

Aiken's Sets, Awls & Tools, No. 20. ₩ doz. $10—dis 50&10 %
Fray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3, $12; 4, $9.....dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18, dis 25 %
Henry's Combination Haft.....₩ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50.....dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50.
Brad Sets, Stanley's Excelsior, No. 2, $4.00.
Brad Sets, Stanley's Excelsior, No. 3, $5.50.
} dis 30&10 %

Axes.

Makers' and Special Brands—
First quality.....₩ doz. $6.00 @ $6.50
Others.....₩ doz. $5.50 @ $5.75

Axle Grease.

Fraser's, in bulk.....Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Frasers, in boxes.....₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting.....10-℔ pails, each, 85¢
Lower grades, special brands.....₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.
Nos. 7 to 18.....dis 50@55 %
Nos. 19 to 22.....dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets.....dis 33⅓ %
Over 10 sets.....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets.....dis 10 %
Over 10 sets.....dis 10&5 %

Bag Holders.

Sprengle's Pat., ₩ doz $18.....dis 60 %

Balances.—Spring Balances.....dis 50 %
Common 24 ℔.....₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances.....dis 50 %
Chatillon's Circular Spring Balances.....dis 60 %

Bells.

Hand—
Light Brass.....dis 70&10 %
Extra Heavy.....dis 60&10 %
White Metal.....dis 60&10&10 %
Silver Chime.....dis 25&10&5 %
Globe (Cone's Patent).....dis 25&10 @ 35 %

Door—
Gong, Abbe's.....dis 25&10 @ 35 %
Gong, Yankee.....dis 40&10 %
Gong, Barton's.....dis 40&10 @ 50 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. ₩ Co.'s.....dis 50&10&2 %
Pull, Brook's.....dis 50&10&2 %
Pull Western.....dis 25&10 %

Cow—
Common Wrought.....dis 60&10 %
Western.....dis 20&10 %
Western, Sargent's list.....dis 70&10 %
Kentucky "Star".....dis 20&10 %
Kentucky, Sargent's list.....dis 70&10 %
Dodge, Genuine Kentucky, new list.dis 70@70&10 %
Texas Star.....dis 50&10 @ 50&10&5 %
Tall.....dis 40@40&5 %
Farm Bells.....₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.—Blacksmiths'.....dis 50&10&5 @ 60 %
Molders'.....dis 40 @ 40&10 %
Hand Bellows.....dis 40&10 @ 50 %

Belting, Rubber.

Common Standard.....dis 70&10 %
Standard.....dis 70 %
Extra.....dis 60&10 %
N. Y. R. & P. Co., Standard.....dis 60&5 %
N. Y. R. & P Co., Extra Standard.....dis 50&10 %

Bench Stops.

Morrill's.....₩ doz $9—dis 50 %
Hotenkiss's.....₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9.....dis 25&10&5 %
McGill's.....₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's.....₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives'.....₩ doz $30.00—dis 60&5 @ 60&10 %
Diagonal.....₩ doz $24.00—dis 40 %
Angular.....₩ doz $24.00—dis 40&5 %

Blind Adjusters.

Domestic.....₩ per doz $3.00—dis 33⅓ %
Excelsior.....₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking.....dis 20 @ 20&10 %

Blind Fasteners.

Mackrell's.....₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern.....$15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern.....$15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern.....$9 ₩ gro. net
Merriman's.....new list, net
Austin & Eddy No. 2008.....$9 ₩ gro. net
Security Gravity.....$9 ₩ gro. net

Blind Staples.

Barbed, ⅛ in. and larger.....₩ ℔ 8 @ 8½¢ net
Barbed, ⅜ in.....₩ ℔ 9 @ 9½¢ net

Blocks.

Ordinary Tackle, list April 17, '85.....dis 40 %
Cleveland Block Co., Mal. Iron.....dis 50 %

Bolts.

Door and Shutter—
Cast Iron Barrel, Square, &c.....dis 70 @ 70&10 %
Cast Iron Shutter Bolts.....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list).....dis 65&10 %
Ives' Patent Door Bolts.....dis 55 %
Wrought Barrel.....dis 70 @ 70&10 %
Wrought Square.....dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list.....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's.....dis 40&10 %
Wrought Shutter, Sargent's list.....dis 60&10 %
Wrought Sunk Flush, Sargent's list.....dis 55&10 %
Wrought Sunk Flush, Stanley's list.....dis 50&10 %
Wrought B. K. Flush, Com'n Stanley's list, dis 55&10 %

Carriage—
Com. list June 10, '84.....dis 70&10&5 %
Genuine Eagle, list Oct., '84.....dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, 84...dis 75&10@75&10&5 %
R. B. & W., old list.....dis 70 %

Tire—
Common, list Feb. 28, 1883.....dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883.dis 65&10 %
P. C. B. & N. Co., Philadel., list Oct. 84. dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list. Oct '84.....dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84.dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84...dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84.....dis 80 %
Am. S. Co., Philadel. list. Oct. 16, 84.....dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83.....dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884.....dis 82 %
R. & E. Mfg. Co.....dis 65 %

Stove and Plow—
Stove.....dis 62½ %
Plow.....dis 60&5 %
Am. S. Co. Stove, Annealed.....dis 62½ %
R. B. & W., Plow.....dis 55 %
R. B. & W. Stove.....dis 62½ %
R. & E. Mfg. Co., Stove.....dis 62½ %
Machine.....dis 75 @ 75&10 %
Bolt Ends.....dis 75 @ 75&10 %

Borax.....₩ ℔ 9½@10½¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglass	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent	5.50	6.75.dis 40&10&10 %
Jennings	5.50	6.75.dis 45&10&10 %
Other Machines	2.35	2.75.....net
Phillips' Pat., with Augers	7.00	7.50.....net

Bow Pins

Humason, Beckley & Co.'s.....dis 60&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck, Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.

Backus, Nos. 110 to 114 and 31 to 33..dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14.....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 9, 11.....dis 70&10&5 %
Barber's, Nos. 10 to 16.....dis 50 %
Barber's, Nos. 30 to 33.....dis 50¢
Barber's, Nos. 40 to 63.....dis 50&10 %
Barker's, Nos. 8, 10 and 12.....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12...dis 65&10@70 %
Osgood's Ratchet.....dis 40&10@50 %
Spofford's.....dis 50&10 %
Ives' New Haven Novelty.....dis 70 @ 70&5 %
Ives' New Haven Ratchet.....dis 6..&5 @ 60&10 %
Ives' Barber Ratchet.....dis 60&5 @ 60&10 %
Ives' Garbers.....dis 60&5 @ 60&10 %
Ives' Spofford.....dis 60&5 @ 60&10 %
Common Nail, American.....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30.....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119.....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Plain.....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled.....dis 65&10 @ 70 %
Amidon's Ratchet.....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet.....dis 60 %
Amidon's Globe Jawed.....dis 40&40&10 %
Amidon's Corner Brace.....dis 40 @ 40&10 %
Amidon's Universal.....8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball.....$1.10 @ $1.15
P. S. & W.....dis 50&10 %

Brackets.

Shelf, plain, Sargent's list.....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list.....dis 60&10 @ 60&10&10 %
Reading, plain.....dis 60&10 @ 60&10&5 %
Reading, Rosette.....dis 60&10 @ 60&10&10 %

Bright Wire Goods.—.....dis 75&10&10@— %

Broilers. Inch..... 9 10 9 x 11
Henis' Self-Basting.. Per doz..... $4.50 5.50 6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut.....dis 55 %
Sargent's.....dis 60&10 @ 70&5 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70 %
Peck, Stow & W. Co.'s.....dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co., White Metal, low list.dis50@50&10 %

Butcher's Cleavers.

Bradley's.....dis 25 @ 30
L. & I. J. White.....dis 20&5 %
Beatty's.....dis 40 @ 40&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40
P. S. & W.....dis 33⅓&5@33⅓&10

Butts.

Brass—
Wrought Brass.....dis 70&10&10 %
Cast Brass, Tiebout's.....dis 33⅓ %
Cast Brass, Corbin's Fast.....dis 33⅓&10 %
Cast Brass, Loose Joint.....dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow.....dis 5&10
Fast Joint, Broad.....dis 55&10
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Jap, Pltd. Tips.
} dis 66⅔&10

Wrought Steel—
Fast Joint Narrow.....dis 70&10 %
Fast Joint, Lt. Narrow.....dis 70&10 %
Fast Joint, Broad.....dis 70&10 %
Loose Joint, Broad.....dis 70&10 %
Table Butts, Back Flaps, &c.....dis 70&10 %
Inside Blind, Regular.....dis 70&10 %
Inside Blind, Light.....dis 70&10 %
Loose Pin.....dis 70&10 %
Bronzed Wrought Butts.....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe

Gautier.....₩ ℔ 5½@6¢
Dewicks.....₩ ℔ 5½@6¢

Can Openers.

Messenger's Comet.....₩ doz $3.00, dis 25 %
American.....₩ gross $3.00
Duplex.....doz 35¢, dis 15 @ 20 %
Lyman's.....₩ doz $3.75, dis 30 %
No. 4, French.....₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle.....₩ gross $6.00, dis 45 @ 50 %
Eureka.....₩ doz $2.50, dis 10 %
Sardine Scissors.....₩ doz $2.75@$3 00 %
Star.....₩ doz $4.75 %
Sprague, No. 1 ₩ 2 3 $2.50.....dis 50&10&10 %

World's Best. ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₩ doz $3.00, dis 35&5 %
Domestic.....₩ doz $2.50, dis 45 %
Champion.....₩ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool..... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₩ doz $2.35
Cast Iron, Steel Points.....₩ doz 80¢
Socket.....₩ doz $1.75
Bullard's.....dis 35 @ 25&10 %

Carpet Sweepers.
Bissell No. 5.....₩ doz $17.00
Bissell No. 7 New Drop Pan.....₩ doz $19.00
Bissell Grand.....₩ doz $36 00
Grand Rapids.....₩ doz $24.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₩ doz $15.00
Jewel.....₩ doz $17.00
Mystic.....₩ doz $16.00
Cottage.....₩ doz $15.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Queen.....₩ doz $16.00
Queen, with band.....₩ doz $18.00
King.....₩ doz $30.00
Weed Improved.....₩ doz $18.00
Hub.....₩ doz $16.00
Cog Wheel.....₩ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed.....} New list:
Plate.....} Brass...dis 55 @ 55&5 %
Shallow Socket.....} Others..dis 60 @ 60&5 %
Deep Socket.....40&10 %
Yale Casters, list May, 1884.....dis 30&10@40 %
Yale, Gem.....dis 60@60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti-friction.....dis 60 @ 60&10 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6¼-16-2, exact sizes.₩ pair, $1 03 } dis 50&10&5 %
Trace, 6¼-10-3, exact sizes.₩ pair, .92 } @ 50&10&7½ %
Trace .7-10-2, exact sizes...₩ pair, 1.11 }
NOTE.—Traces, "Regular" sizes 3¢ net ₩ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 8.75 6.00 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢@½¢ ₩ ℔.
German Coil, list of June 20, 1887....dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35@2 %
Oneida Halter Chain.....dis 60 @ 60&5 %
Galvanized Pump Chain.....₩ ℔ 6¢ @ 6½¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

Chalk.
White.....₩ gro 50¢
Red.....₩ gro 70¢
Blue.....₩ gro 85¢
White Crayons.....₩ gro 12¢ @ 12½ dis 10¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
P., S. & W.....} dis 75&5 @
New Haven and Middlesex.....} 75&10 %
Mix.....}
Buck Bros.....dis 30 %
Merrill.....dis 60&10@60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Witherby and Douglass.....dis 75 @ 75&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to $
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels.₩ ℔.....16¢ @ 19¢

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 66⅔&10 %
Carriage Makers', Sargent's.....dis 66⅔&10 %
Eberhard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₩ ℔ 5½¢
Steel Felloe Clips.....₩ ℔ 5¢
Cockeyes.....dis 50 %

Cocks, Brass.
Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. , 1888.....dis 50&2 %
American, Enterprise Mfg Co.....dis 20&10@30 %
The "Swift," Lane Bros.....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers.....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&10 %

Crow Bars.
Cast Steel.....₩ ℔ 4¢
Iron, Steel Points.....₩ ℔ 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₩ doz $10.00, dis 20 %
Perfect.....dis 50 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to £

Dampers, &c.
Dampers, Buffalo.....dis 50 %
Buffalo Damper Clips.....dis 40 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₩ doz $1.30
Gray's.....₩ gro, $20.00, dis 20 %
Bee Rod.....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₩ doz $15.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₩ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
P, S. & W.....} dis 75&5 @
Mix.....} 75&10 %
New Haven and Middlesex.....}
Merrill.....dis 60&10&10 %
Witherby and Douglass.....dis 75@75&5 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 20 @ 25 %
Wilkinson's Folding.....dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Briggs' P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20@20 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Triple Action.....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1? %
Automatic Boring Tools.....each, $1.75 @ $1.85
Twist Drills—
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.
Small sizes.....₩ ℔ 7¢
Large sizes.....₩ ℔ 6½¢

Egg Beaters.
Dover.....₩ doz., $2.00
National.....₩ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₩ gro, $17.00@$18.00
Standard (Standard Co.).....₩ gro, $9.00
Kingston (Standard Co.).....₩ gro, $6.50
Acme (Standard Co.).....₩ gro, $6.00
Duplex (Standard Co.).....₩ gro, $18.00
Rival (Standard Co.).....₩ gro, $12.00
Triumph (T. & S. Mfg. Co.).....₩ gro, [illegible] 10.50@$11.50
Advance No. 1.....₩ gro $10.50
Advance, No. 2.....₩ gro $10.00
Bryant's.....₩ gro $15.00
Ayres' Spiral.....₩ gro $5
Double (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Easy (Hamblin & Russell Mfg. Co.).....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.).....₩ gro, $4.50
Paine, Diehl & Co's.....₩ gro $24.00

Electric Bell Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

Emery.	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₩ ℔	4 ¢	5 ¢	2½¢
½ kegs, ₩ ℔	4¼¢	5¼¢	2¾¢
¼ kegs, ₩ ℔	4½¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&10&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bbl. lots.....dis 50&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₩ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₩ doz $36.00—dis 25&10 %

Feltoe Pieces......₩ ℔ 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati .dis 45&5 %

Files.
Domestic—
Nicholson Files, Rasps, &c.dis 50&15&5@50&15&10 %
Nicholson (X. F.) Files.....dis 25 %
Nichols n's Royal Files (Seconds)dis 75 (extra prices on certain sizes.)
Other makers, best brands.....dis 60&5 @ 60&10&5 %
Fair brands.....dis 60&10&10 @ 70 %
Second quality.....dis 70&5 @ 75 %
Heller's Horse Rasps.....dis 50&7½ @ 50&10 %
McCaffrey's Horse Rasps.....dis 50&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps.....American list .dis 60 %

Fluting Machines.
Knox, 4½-inch Rolls.....$3.25 each
Knox, 6-inch Rolls.....$3.60 each } dis 35 %
Eagle, 3½-inch Roll.....$2.15, dis 35 %
Eagle, 5½-inch Roll.....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $2.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.dis 30 %
Shepard Hand Fluter, No. 85.....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₩ doz $11, dis 40 %
hepard Hand Fluter, No. 95.....₩ doz $8, dis 40 %
Clark's Hand Fluter.....₩ doz $15.00, dis 35 %
Combined Fluter and Bad Iron...₩ doz $15.00, dis 30 %
Buffalo.....₩ doz $10.00. dis 10 %

Fluting Scissors......dis 45 %

Forks.—Hay, Manure, &c., Asso. list.....dis 65&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Buffalo Champion.....dis 60&10&5 %
Shepard's Lightning.....dis 65 %
White Mountain.....dis 60 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₩ doz $4.50
Shepard's Queen City.....dis 40 %

Fry Pans.
High List.....dis 75&5 @ 75&10&5 %

No..	0	1	2	3	4	5	6	7	8
₩ doz	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11 25

Low List.....dis 70&10 %

No	0	1	2	3	4	5	6	7	8
₩ doz..	$3.00	3.75	4.25	4.75	5.25	6 00	7.00	8.00	9.00

Fuse.
₩ 1000 ft.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise, &c.....dis 60&10 %
Wire, low list.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₩ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₩ gross $12, dis 25 @ 25&5 %

Glue.—La Pare's Liquid.....dis 25 @ 25&5%
Upton's Liquid.....dis 35 %

Glue Pots.
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 50 %

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼-in., Hemp.....dis 40&2 %
Covert's Adj. Rope Halters.....dis 40&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co.....} List Jan. 15, '87
C. Hammond & Son.....} Dis. 50 @ 50&
Humason & Beckley.....} 10 %
Atha Tool Co.....
Fayette R. Plumb.....dis 40&10 @ 50
Verree.....dis 5 %
Magnetic Tack. Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 20 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under.....₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 36¢ } ....dis 70 %
Over 5 ℔.....₩ ℔ 30¢ }
Wilkinson's Smiths'.....10½¢ @ 11¢ ₩ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz...dis 10%
Providence Tool Co. Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished. ₩ doz, $18; Nickeled, $57; 3 Hands, Polished, ₩ doz. $72; Nickeled, $54.....dis 25 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.....	0	1	2	3	4
Per doz..	$0.90	1.00	1.18	1.35	1.50

....dis 60&10&10 %
Roggin's Latches.....₩ doz. 30¢ @ 35
Bronze Iron Drop Latches.....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₩ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₩ gross $2.00
Hickory Firmer Chisel, assorted.....₩ gross 4.50
Hickory Firmer Chisel, large.....₩ gross 5.0
Apple Firmer Chisel, assorted.....₩ gross 5.00 } dis 40
Apple Firmer Chisel, large.....₩ gross 6.00 }
Socket Firmer Chisel, assorted.....₩ gross 3.00 }
Socket Framing Chisel, assorted.....₩ gross 5.00 }
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₩ gross 2.75 } dis 40 @
Auger, assorted.....₩ gross 5.00 } 40&10 %
Auger, large.....₩ gross 7.00 }
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₩ set $1.25 net
Patent Auger, Swan's.....₩ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 20¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 65 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70 %
Climax Anti-Friction.....dis 55 %
Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 50 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 75&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree.....dis 50&10 %
Kidder's.....dis 50&10 @ 60 %
The "Ives".....dis 60 %

Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent. ₩ doz. pr. 4 in. $10; 5 in., $12.....dis 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18.....dis 50&15 @ 60 %
Wood Track Iron Clad.....₩ ft. 10¢, dis 50&15 @ 60 %
Carrier Steel Anti-Friction.....dis50 @ 50&5 %
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₩ set $4.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&5 %
American.....₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 6½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel Cast Iron.....dis 50 %
Nickel Malleable Iron and Steel.....dis 40 %
Scranton Anti Friction Single Strap.....dis 33⅓ %
Scranton Anti-Friction Double Strap.....dis 40 %
Universal Anti Friction.....dis 40 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz $5.50 $6.00 $6.50
Claw, Nos. 1 2 3.....₩ doz 6.00 6.50 7.00
Lathing Nos. 1 2 3.....₩ doz 5.50 6.00 6.50

Hay Knives.

Lightning.....Mfrs. price ₩ doz $18 dis 25 %; Jobber's Extras
Electric.....₩ doz $17 ; dis 30 @
Gem.....₩ doz $18 ; 30&5%
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—
Strap and T.....dis 70&10 @ 70&10&5 %
Screw Hook and Strap, { 8, 10, 12 in., ₩ ₺ 3¾¢ / 14 to 36 in. ₩ ₺ 2¾¢
Heavy Welded Hook { 8 to 12 in., ₩ ₺ 3¾¢ / 14 in. & up, ₩ ₺ 2¾¢
Screw Hook and Eye { ⅝ in.....₩ doz $1.50 / ½ in.....₩ doz $2.45 / ⅜ in.....₩ doz $3.80 } dis 10%
Rolled Blind Hinges, Nos 32 and 34.....dis 50&10
Rolled Blind Hinges, Nos. 232 and 234.....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10
Plate Hinges { 8, 10 & 12 in., ₩ ₺ / "Providence" } over 12 in., ₩ ₺ 4
Spring Hinges—
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme and U. S.....dis 30 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %
Gate Hinges—
Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60&10 @ 60&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20.dis 60&10@60&10&10 %
Shepard's, No. 3.....dis 60&10@60&10&10 %
Reed's Latch and ringes.....₩ doz sets $12, dis 50 %
Blind Hinges—
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75&10&5&80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's "Noiseless." Nos. 50, 60, 65 & 55.....dis 75&10&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5...dis 80 %
Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 80&2½ %
Shepard's Champion Gravity No. 75.....dis 80&10&5 %
Shepard's Steamboat Gravity, No. 10....dis 80&20 %
Shepard's Acme Lull & Porter.....dis 75&5&75&10 %
Shepard's O. S. Lull & Porter.....dis 75&10 %
Shepard's "Queen City" Reversible.....dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.00; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.

Handled—
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ doz $4.75
Eye—
D. & H. Scovil.....dis 15 %
Lane's Crescent Scovil Pattern.....dis 5 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard. S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Bare " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.....₩ doz. $4.50
Hill's Old Style Ringers.....₩ doz. $3.00
Hill's Tongs.....₩ doz. $4.50
Hill's Rings.....₩ doz boxes, $2.25 @ 2.40
Perfect Rings.....₩ doz boxes $1.75 @ 2.00
Perfect Ringers.....₩ doz. $2.50
Blair's Hog Ringers.....₩ doz, $2.00 @ $2.65
Blair's Hog Rings.....₩ doz 95¢ @ 1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz, $1.25 @ 1.30

Hoisting Apparatus

"Moore's" Hand Hoist, with Lock Brake.....dis 50
"Moore's" Differential Pulley Block.....dis 40

Holders, File and Tool.

Ralz Pat.....₩ doz $4; dis 25 %
Nicholson File Holders.....dis 20 %

Hollow-Ware.

Iron—
Stove Hollow-Ware. Ground...dis 60&10@60&10&5 %
Stove Hollow-Ware. Unground....dis 70&5&70&10 %
Enamelled and Tinned Hollow-Ware—
Kettles.....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&5 @ 40&10 %
Gray Enameled Ware.....dis 40 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % cash in 30 days.
Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.

Cast Iron—
Bird Cage. Sargent's list.....dis 60&10&10 %
Bird Cage, Reading.....dis 60&10&10 %
Clothes Line. Sargent's list.....dis 60&10&10 %
Clothes Line, Reading list. dis 60&10 @ 60&10&10 %
Ceiling. Sargent's list.....dis55&10&10 %
Harness. Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat. Sargent's list.....dis 55&10 %
Coat and Hat. Reading.....dis 55&10 @ 55&10&10 %
Wrought Iron—
Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops
Wire—
Wire Coat and Hat, list April, 1886.....dis 45 %
Wire Coat and Hat. Miles', list April, 1886.....dis 45
Indestructible Coat and Hat.....dis. 45 %
Wire Coat and Hat, Standard.....dis 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₩ doz $2.00
Rush.....dis 55 @ 60 %
Whittree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

	Nos. 6	7	8	9	10	
Ausable	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton. Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Lyra	25¢	23¢	22¢	21¢	20¢	dis 40&10&2½@50 %
Snowden	25¢	23¢	27¢	21¢	20¢	dis 40&10&2½@50 %
Putnam	24¢	22¢	21¢	20¢	19¢	dis 5&10&2½&2½ %
Vulcan	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
Northwest'n	25¢	23¢	22¢	21¢	20¢	dis 10&10&5&5 %
Globe	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
C. B.-K	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
Champlain	28¢	26¢	25¢	24¢	23¢	dis25&10&10 %
New Haven	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac	23¢	21¢	20¢	19¢	18¢	dis 50&10 %
Champion	25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell	28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star	23¢	21¢	20¢	19¢	18¢	dis 10&10@10&12½&5 %
Anchor	23¢	21¢	20¢	19¢	18¢	dis 25 %
Western	23¢	21¢	20¢	19¢	18¢	dis 40&10 %
Empire Bronzed						1¼ per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....75&10 & 80 %
Standard.....dis 70@75&10 %
Extra.....dis 60 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50 %
N. Y. B. & P. Co. Dundee.....dis 60&10&5 %

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd.....₩ doz $3.00, dis 20@20&5 %
National Ice Chisel.....₩ doz $6.25, dis 20 %
Novelty Ice Breakers.....₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.....₩ doz $2.00, dis 15 %
Wood Head Picks. Sargent's....₩ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's.....₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle.....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₩ doz $1.25, dis 20&10 %
Combination Ice Tools.....₩ doz $2.00 net
Acme Ice Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.....₩ doz $4.00, dis 25&10 %
Family.....₩ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped.
Brass, 7 to 17 in., ₩ ₺	24¢	22¢
Brass larger than 17 inches, ₩ ₺	26¢	24¢
Enameled and Tea Kettles	See *Hollow-Ware*	

Keys.

Lock Asso'n list Dec. 30, 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Banks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₩ doz $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.....₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ doz $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₩ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.

Door Mineral.....65@68¢
Door Por. Jap'd.....75@78¢
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@6.&10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....dis 40 %
Furniture Plain.....75¢ gross inch. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 60%&10 %
Picture, Hemacite.....dis 55&5 %
Shutter, Porcelain.....dis 65&10 %
Carriage, Japanned.....₩ gross 30¢, dis 60&10 %

Ladles.

Melting, Sargent's.....dis 55&10 %
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₩ doz. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lawn Mowers.

Standard List.....dis 50&10 %
Enterprise.....dis 60&10 %

Lanterns.

Tubular, Plain with Guards.....₩ doz $4.00 @ $4.25
Tubular, Lift Wire, with Guards...₩ doz $4.00 @ $4.75
Tubular, Square Plain, with Guards, ₩ doz $4.25 @ $4.25
Tubular, Sq. Lift Wire, with Guards, ₩ doz $4.50 @ $4.75
Without Guards, 25¢ ₩ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $8.75. dis 20@25%

Lemon Squeezers.

Porcelain Lined, No. 1.....₩ doz. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ doz $1.70 @ 1.75
Dunlap's Improved.....₩ doz. $3.75, dis 20 %
Sammis'.....No. 1, $5; 2, $9; 12, $18 ₩ doz., dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ doz $2.50
Dean's.....Nos. 1, ₩ doz $3.50; 2, $3.35; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25...dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 45
Wire Clothes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ doz dis 20%

Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.—
List, Dec. 30, '86, chgd Feb. 2, '87...dis 50&10 @ 60&5 %
Note.—Lower net prices often made.
Sargent & Co. (list Feb. 1, 1888).....dis 50&10&2 %
Reading Hardware Co. (list Feb. 2, '88).dis 55@60&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Many's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Dietz Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S.".....dis 35%
"Feiter" or "American".....dis 40&10 %
Reed's N. Y. Hasp Lock.....dis 25 %
Cabinet—
Eagle, Gaylord Parker and Corbin, { List March, '84, revised / Jan. 1, '85. } dis 33⅓&2 %
Delts, Nos. 36 to 39.....dis 40 %
Delts, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 96.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
"Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
"Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %
Padlocks—
List, Dec. 23, 84.....dis 65&10&2&—%
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's, Nos. 0 to 91.....dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 505...dis 15 %
A. E. Dietz.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
"Star".....dis 45 %
"Horse Shoe," ₩ doz., $9.....dis 40 %
Barnes Mfg. Co.....dis 40%
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis90 %
Fraim's Pat. Scandinavian new list (low)....dis 60 %

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....₩ doz $20.00
Ring Peaves, Common Finish.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies.....₩ doz $19.00
Cant Hooks, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Common Finish.....₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin.₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₩ doz $12.00
Hand Spikes.....₩ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz.....10.00 11.00 13.00 16.00 20.00
Pike Poles, not Ironed, ₩ doz.....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ doz.....14.00 15.00 17.00
Swamp Hooks.....₩ doz $18.00
Landing Blocks.....₩ doz $22.50
Skidding Tongs.....₩ doz $51.00
Log Binders.....₩ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25%; 5 to 10 M, dis 30%
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples.....₩ doz $30.00

Lustre.

Four-ounce Bottles.....₩ doz. $1.75 ₩ gro. $17.00

Mallets.

Hickory.....dis 20&10@20&10&10 %
Tarnumvitae.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V...dis 30 @ 30&10 %

Match Safes.

Dangerfield's Self-Igniting.....₩ doz $1.25

Mattocks.—Regular list.....dis 60&5 @ 60&10 %

Meat Cutters

Dixon's—Nos. 1 2 3 4
₩ doz.....$14.00 17.00 19.00 30.00—dis 45 %
Woodruff's.....Nos. 100 150
₩ doz. $15.00 18.00—dis 45 %
Champion.....Nos. 200 300 400
₩ doz. $22.00 $7.00 40.00—dis 45 %
Hales' Pattern Nos. 11 12 13
₩ doz...$27.00 33.00 45.00 } dis 70 @ & 5 %
American.....dis
Nos..... 1 2 3 4B
Each.....$5.00 7.00 10.00 25.00 50.00 60.00
Enterprise.....dis 30 %
Nos..... 10 12 22 32 42
Each.....$3. 2.50 4.00 6.00 15.00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ doz. $22.00 30.00 40.00—dis 45@45&10%
Home No. 1.....$26 ₩ doz, dis 55&10 %
Draw Cut..Nos.. 5 2 6 8
Each....$50.00 75.00 80.00 $35.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz, $66.00

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $13; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's. ₩ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....dis 50&10@40 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10@10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %
Boss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00. ₩ doz, dis 60&10&10 %

Money Drawers.—₩ doz., $18 @ $20.

Muzzles.—Safety, ₩ doz. $3.....dis 25 %

Nails.....See Trade Report
Wire Nails & Brads, list July 14, '87..dis 70@70&5 %
Wire Nails, Standard Penny.....₩ keg, $2.75 @ $2.80

Nail Puller.—Curtiss Hammer.. ₩ doz $9.00 net
Giant, No. 1.....₩ doz $30.00, dis10 %
Pelican.....₩ doz $9.00, dis 25 %
Boss.....₩ doz $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Hurmason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00. dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts
Nuts, all kinds, 5¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....₩ ℔ 8¼¢
U. S. Navy.....₩ ℔ 7½¢
Navy.....₩ ℔ 6¾¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 50&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₩ ℔ 65¢, dis 30 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13 @ 14¢ ₩ ℔
Cotton Packing.....15 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—
Quarts.....10 12 14
Hill's Light Weight, ₩ doz.....$2.75 3.00 3.25
Hill's Heavy Weight, ₩ doz.....2.00 3.25 3.75
Whiting's.....2.75 3.00 3.25
Sidney Shepard & Co.....2.67 .... 3.23
Iron Clad.....2.75 3.00 3.25
Fire Buckets.....2.75 3.25 3.50
Buckets, see Well Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4.50
Fire, Stable and Milk, 14 qt.....₩ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %
Adze Eye, 5 to 6. $12.00; 6 to 7, $13.....dis 60 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Miles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under. Plain.....dis 55 %
1¼ and under. Galvanized.....dis 47½ %
1¼ and over, Plain.....dis 65 %
1¼ and over, Galvanized.....dis 52½&55 %
Boiler Tubes, Iron.....dis 55 @ 60 %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50 @ 50&5 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)..dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.dis 20&10 %
Victor Planes (Stanley R. & L. Co.).....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
Chaplin's Iron Planes.....dis 40 @ 40&5 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to 2
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co.'s "Thistle"....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron." Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2. 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz dis 20& 10@ 33⅓ %
Bumasson & Beckley Mfg. Co.....dis 50@50&10 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $10.50 @ $12
Round or Square, 2 qt.....₩ gro $23.50 @ $24

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00. dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Leed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole. Auger, per doz....$13 00 @ $14.00
Konler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $18.00, dis 20&10 %
E. S. Lee & Co.'s Prunin Tools.....dis 40 %
Pruning Shears, Henry Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chise.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10 @ 50&10&5 %

Hay Fork, "Anti-Friction," 5 in. Solid, $5.70....dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 90&2 %
Rice Hand Punches.....dis 15 %

Rail.
Sliding Door, Wrt. Brass ₩ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted....₩ foot 4¢, dis 20&10&5 %
Barn Door, Light...Inch. ⅝ ¾
Per 100 feet.....$2.50 3.00 4.40—dis 10 %
₩ ℔ for N. E. Hangers—
Small. Med. Large
Per 100 feet.....$2.15 2.70 3.25 net
Terry's Wrought Iron, ₩ foot.....4¼¢ @ 5¢
Victor Track Rail. 7¢ ₩ foot.....dis 50&2 %
Carrick Steel Rail, per foot.....4½¢

Rasps.
Cast steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peeriess..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to $. dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50, with Jobbers' Extras.
Iron, list November 17, 1887.....dis 50 %

Rivet Sets......dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 2&2 %
Stair. Black Walnut.....₩ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....½ inch and larger ₩ ℔ 10¾¢ net
Manila.....⅜ inch ₩ ℔ 11½¢ net
Manila.....⅜ and 5-16 inch ₩ ℔ 11¾¢ net
Manila Tarred Rope.....₩ ℔ 10½¢ net
Manila, Hay Rope.....₩ ℔ 10¾¢ net
Sisal.....½ inch and larger ₩ ℔ 8¾¢ net
Sisal.....⅜ inch ₩ ℔ 9¼¢ net
Sisal.....⅜ and 5-16 inch ₩ ℔ 9½¢ net
Sisal, Hay Rope.....₩ ℔ 8½¢ net
Sisal, Tarred Rope.....₩ ℔ 8¾¢ net
Sisal, Medium Lath Yarn.....₩ ℔ 7¼¢ net
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢

1½% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 50&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.75 @ $2.85
Self-Heating.....₩ doz. $9.00 net
Self-Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Potts's Irons.....dis 40@40&5 %
Enterprise Star irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₩ ℔ 28¢ @ 29¢
Common Peneia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....60¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton.....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap d. Cop'd and Br'sed..₩ gross $1.00
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&2 %
Hugunin's New Sash Locks. list Jan. 5, '87..dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Liesche's Nos. 100 & 110 ₩ gro. $8: 105. $10..dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55@55&5 %

Sash Weights.
Solid Eyes.....₩ ton. $25

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ dos. $20, dis 50@50&5 %
Perry.....₩ dos. No. 1, $15: No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $30.00, dis 30 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Silver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %
Disston's Cross Cuts..dis 45@45&5 %
Disston's Hand.....dis 25@25&5 %
} Extras sometimes given by jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 70¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts. Regular ₩ foot .24@26¢
W. M. & C. X Cuts. Thin Back.....₩ foot 27@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts. Thin Back.....₩ foot 27@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₩ dos $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ dos $3.25 and $5.25, dis 40&5&40&10%
Common Lever.....₩ dos $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 55&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, $9. No. 15, $5.50, dis 20&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.00 @ $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %

Saw Tools.
Atkins Perfection....$15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter, No. 171, good quality.....₩ doz $21
Hatch, Tea, No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.30 @ 2.35
Union Platform, Striped.....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Scale Beams. Custer.....dis 30@33⅓ %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 30&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons. Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 70&10&10 %
Sargent & Co.'s No. 20.....dis 60%&10&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel.....dis 60&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 70&10 %
Knapp & Cowles' No. 1.....dis 20@20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4.....dis 50&5 @ 50&10&5 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Ellrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25&10 %
Kolb's Common Sense.....₩ doz $6, dis 25&10 %

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro. 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %

Lag, Blunt Point.....dis 70 @ 70&10 %
Coach and Lag, Gimlet Point.....dis 70 @ 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 62½&10 %
Hand Rail, Burnham, Beckley & Co.'s..dis 70&10&75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.

Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

Scythe Snaths.

.....dis 50&10 %

Shears.

American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881 dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec., 1881..dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers..dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel..dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %

Sheaves.

Sliding Door—
M. W. & Co., list Jan. 1, 1887.....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 70 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2
Moore's Anti-Friction.....dis 60

Sliding Shutter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.

L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.

Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—Add $1 ₩ keg to above prices.

Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot.—(*Eastern prices, 2¢ off, cash, 5 days.*)
Drop, ₩ bag, 25 ℔.....$1.50
Drop, ₩ bag, 5 ℔.....35
Buck and Chilled, ₩ 25-℔ bag.....$1.75
Buck and Chilled, ₩ 5-℔ bag.....40

Shovels and Spades.

Ames' Shovels, Spades, &c., list Nov. 1, 1885...dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 15 @ 15&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886...dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.

Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.

Western list.....d's 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdal Iron Co.....dis 50&10 %
Utica P. S. T. Skeins.....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.

Buffalo Metallic. S. S. & Co., new list..dis 50&25&10 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested. ₩ doz.	70¢	90¢
Mesh 20, Nested, ₩ doz.	85¢	$1.00
Mesh 24, Nested. ₩ doz.	$1.00	1.10

Slates.—School, by case.....dis 50&10 %

Snaps, Harness, &c.

Anchor (T. & S. Mfg Co.).....dis 60 %
Pitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 40 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40@10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 50@2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.

Covert's Adjustable. list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 20 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.

Bonney's.....₩ doz $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass.....₩ doz $9.00. d's 20 %

Spoons and Forks.

Tinned Iron—
Basting, Central Stamping Co.'s list. dis 70@70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo S. S. & Co.....dis 35@2 %

Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50 @ 50&10 %
Simpson, Hall, Miller & Co.....dis 50 @ 50&10 %
Holmes & Edward Silver Co.....dis 50 @ 50&10 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 40&5 %
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 55 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 40&10 %
Boardman's Brit'nia Spoons, case lots..dis 50&10 %

Extra 10 % generally given.

Springs.

Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.

Steel and Iron.....
Nickel-Plated.....dis 70 @ 75&5 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

Staples.

Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain..... } See Trade Report.

Steelyards.

.....dis 40&10@50&5 %

Stocks and Dies.

Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 5¢.
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 21 @ 22¢
Washita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1. Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone. No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone. No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Wheels, ₩ gro.....$24.00

Stove Polish.

Joseph Dixon s.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13

Yates' Liquid,	2	3	5	10 gal. cans
₩ gal...	$0.90	.80	.70	.60

Yates Standard Paste Polish ,10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00

Tacks, Brads, &c.
List, Jan. 2, 1888.

American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks..dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers'Tacks.dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks....dis 67½&10&2 %
Swedes Iron Miners' Tacks.....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 3½&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Blued.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list....dis 50&10 %

Tap Borers.

Common and Ring.....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.

Steel Wire, Standard list.....dis 50&10&5 %

Tinners' Shears, &c.

Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Wallinson & Co.....dis 33⅓ %

Tinware.

Stamped, Japanned & Pieced, list Jan. 20, 1887.....dis 70 @ 70&10&5 %

Tire Benders, Upsetters, &c.

Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion.....dis 20&10 @ 30 %
Wood Bottom.....₩ doz $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ doz $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Clipper (Sargent & Co.).....₩ doz $24, dis 50&10&10 %
Acme.....₩ doz $20.00, dis 40 %

Transom Lifters

Wollensak's Patent Iron Bronzed.....dis 50 %
Reiher's bronzed Iron rods list Jan. 1, 1887..dis 50&2 %
Reiher's Real Bronze or Nickel Plate. list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50 %

Traps.

Game—
Newhouse.....dis 35 @ 40&5 %
Oneida, Pattern.....dis 60&10&10 @ 70 %
Game, Blake's Patent.....dis 40&10&5 %

Mouse and Rat—
Mouse, Wood Chaser.....₩ doz house 11@12s
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 10 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.

Lothrop's Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %

Trier.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.

B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	B.
No. 9, Flax Twine, ¼ and ½ ℔ Balls	22¢	30¢ ..
No. 12, " " ¼ and ½ "	21¢	29¢ ..
No. 18, " " ¼ and ½ "	18¢	28¢ ..
No. 24, " " ¼ and ½ "	18¢	28¢ ..
No. 36, " " ¼ and ½ "	16¢	27¢ ..
No. 264, Mattrass, ¼ and ½ "		48 @ 50¢
Chalk Line, Cotton, ¼ ℔ Balls		.25¢
Mason Line, Linen, ¼ "		.55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)		11¼¢
3-Ply Hemp, 1 ℔ Balls		12 @ 12½¢
3-Ply Hemp, 1¼ ℔ Balls		11 @ 11¼¢
Cotton Wrapping, 5 Balls to ℔		15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ¼ ℔ Balls		.10¢
Wool		6¼¢ @ 6¾¢
Paper		13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz.		18¢

Vises.

Solid Box.....dis 50&10&5 @ 60 %

Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40%
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %

Saw Filers—
Bonney's, Nos. 2 & 3.....₩ doz $15.00, dis 40 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 60&10&10 %
Hopkins'.....₩ doz $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.

Per lb.....2¼¢

Washer Cutters.

Smith's Patent.....₩ doz $12.00, dis 60&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's.....₩ doz Pol. $14; Jap'd, $16..dis 55 %
Appleton's.....₩ doz $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	7	5¼	4¼	3¼	2½	3¼	3½

In lots less than 200 ℔, ₩ ℔, add 1¢, 5-℔ boxes 1¢ to list

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.

Hill's.....₩ doz ..12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band..₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire.

Iron—
Market, Br. & Ann., Nos. 0 to 18.....dis 75@75&5 %
Market, Coppered, Nos. 0 to 18.....dis 70@70&10 %
Market, Galvanized, Nos. 0 to 18.....dis 65&10 %
Market, Tin'd, Tinned list Nos. 0 to 18.....dis 67½@67½&10 %
Stone Br. & Ann'd, Nos. 16 to 18.....dis 72½&5@75 %
Stone, Bright & Ann'd, Nos. 19 to 26..dis 75&5@75&10 %
Stone, Br. & Ann'd, Nos. 27 to 36...dis 75&10&5@80 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36..dis 70&10@75 %
Tinned Broom Wire, Nos. 18 to 24.....dis 72½@75 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 75@75&5 %
Annealed Grape, Nos. 10 to 14.....dis 75@75&5 %
Brass and Copper, list, Jan. 18, '84.....dis 15 @ 20 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 5 %
Malin's Steel and Tinned Wire on Spools.....dis 50 %
Malin's Brass and Copper Wire on Spools.....dis 40 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to $ dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $2.00, dis 20 %
Wire Clothes Lines.—See Lines.

Wire Cloth, Netting, &c.

Painted Screen Cloth, No. 34, ₩ 100 sq. ft.....$1.90
Painted Screen Cloth, No 33, ₩ 100 sq. ft.....$2.09
Galvanized Wire Netting.....dis 70&10 @ 75 %

Wire Goods.—See Bright Wire Goods

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 40
Baxter's Adjustable "S".....dis 40&10 @ 50
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&2
Coes' "Mechanics'".....dis 55&10&2 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....dis 80 @ 80&5 %
Lamson & Sessions' Agricultural.....
Sterling Wrought.....
Bemis & Call's Patent Combination.....dis 30 %
Bemis & Call's Merrick's Pattern.....dis 30 %
Bemis & Call's Brigg's Patterns.....dis 20 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40%
Bemis & Call's No. 8 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40%
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 2. @ 25 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 25 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 10&3½
Walker's.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wringers, Clothes.

List Jan. 10, 1888 $3.00 off.

Wrought Goods.

Staples Hooks, &c., list Jan. 12, '87..dis 80&20@3.09 20 %

CURRENT METAL PRICES.

JUNE 6, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :
⅜ to 2 in. round and square.. } ₱ lb 1.90 @ 2.00¢
1 to 6 in. x ⅜ to 1 in..... }
Refined Iron :
⅜ to 2 in. round and square.. }
1 to 4 in. x ⅜ to 1½ in..... } ₱ lb 2.10 @ 2.25¢
4½ to 6 in. x ⅜ to 1 in ..... }
1 to 6 in. x ¼ and 5-16 ..... ₱ lb 2.30 @ 2.45¢
Rods—⅝ and 11-16 round and sq.. ₱ lb 2.20 @ 2.35¢
Bands—1 to 6 x 3-16 to No. 12..... ₱ lb 2.30 @ 2.45¢
"Burden Best" Iron, base price.. ₱ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price... ₱ lb 2 80 @ ....¢
"Ulster" ₱ lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2¾¢ @ 3¢
Best Cast Steel, base price in small lots 9¢ @ 10¢
Best Cast Steel Machinery, base price in small lots..... 5½¢ @ 6¢

Extras on Merchant Steel.

For classification and extras adopted by the Merchant Steel Association of the United States January 11, 1888, see *The Iron Age*, Feb. 23, 1888.

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16.....	₱ lb 2.75 @ 2.80¢	3.25 @ .....¢
17 to 20	₱ lb 2.85 @ 3.00¢	3.25 @ 3.50 ¢
21 to 24.....	₱ lb 3.00 @ 3.10¢	3.50 @ .....¢
25 and 26.....	₱ lb 3 20 @	3.50 @ .....¢
27.....	₱ lb 3.35 @ 3.37½¢	3.75 @ .....¢
28.....	₱ lb 3.50 @ .....¢	4.00 @ .....¢
	B. B.	2d qual.
Galv'd, 14 to 20, ₱ lb.,	4.50 @	4.38 @ .....¢
Galv'd, 21 to 24, ₱ lb.,	4.87½ @	4.75 @ .....¢
Galv'd, 25 to 26, ₱ lb.,	5 25 @	5.12 @ .....¢
Galv'd, 27.....	₱ lb., 5.62½ @	5.48 @ .....¢
Galv'd, 28.....	₱ lb., 6.00 @	5.85 @ .....¢
Patent Planished.....	₱ lb A 10¢	B, 9¢
Russia.....	₱ lb 9½¢ @ 10¢	
American Cold Rolled B. B.....	₱ lb 5¢ @ 7¢	

English Steel from Store.

Best Cast	₱ lb 15 ¢
Extra Cast	₱ lb 16½ @ 17 ¢
Swaged, Cast.....	₱ lb 16 ¢
Best Double Shear.....	₱ lb 15 ¢
Blister, 1st quality.....	₱ lb 12½¢
German Steel, Best.....	₱ lb 10 ¢
2d quality.	₱ lb 9 ¢
3d quality	₱ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₱ lb 15 ¢
2d quality.....	₱ lb 14 ¢
3d quality.....	₱ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	26¢
Straits, Pigs.....	22¢
English, Pigs.....	23¢
Straits in Bars.....	26¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....	IC, 10 x 14.....	$6.25
" "	IC, 12 x 12.....	6.50
" "	IC, 14 x 20.....	6.25
" "	IC, 20 x 28.....	12.75
" "	IX, 10 x 14.....	7.75
" "	IX, 12 x 12.....	8.00
" "	IX, 14 x 20.....	7.75
" "	IX, 20 x 28.....	15.75
" "	DC, 12½ x 17.....	5.75
" "	DX, 12½ x 17.....	7.25
Calland Grade.....	IC, 10 x 14.....	5.75
" "	IC, 12 x 12.....	6.00
" "	IC, 14 x 20.....	5 75
" "	IX, 10 x 14.....	7.25
" "	IX, 12 x 12.....	7.50
" "	IX, 14 x 20	7.25
Allaway Grade.....	IC, 10 x 14.....	$5.25 @ ....
" "	IC, 12 x 12.....	5.50 @ ....
" "	IC, 14 x 20.....	5.25 @ ....
" "	IC, 20 x 28.....	10.75 @ ....
" "	IX, 10 x 14.....	6.25 @ ....
" "	IX, 12 x 12	6.50 @ ....
" "	IX, 14 x 20.....	6.25 @ ....
" "	IX, 20 x 28..	12.50
" "	DC, 12½ x 17.....	5.00 @ ....
" "	DX, 12½ x 17... ...	6.00 @ ....

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.....	$4.80 @	
10 x 20.....	7.50 @	7.65
20 x 28.....	10.00 @	10.15
IX, 10 x 14, 14 x 20.....		5.65
BV Grade.—IC, 10 x 14, 14 x 20.....	4.70 @	

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20.....	$4.62½ @ ....
20 x 28.....	9 25 @ ....
IX, 14 x 20.....	5.62½ @ ....
20 x 28.....	11.37½ @ ....
Abecarne Grade.—IC, 14 x 20.....	4.50 @ ....
20 x 28.....	9.00 @ ....
IX, 14 x 20.....	5.50 @ ....
20 x 28.....	10.80

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.....	$12.50 @ $12.75
IXX, 14 x 28.....112 sheets.....	12 75 @
IXX, 14 x 31.....112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₱ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 ₱ ct ad valorem.

Ingot.

Lake.....	17¢ @ 17.50¢
"Anchor" Brand.	16.50¢ @ 17¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	...
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	..	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.	
Per pound.....	$0.28	0.30	0.32	0 35	

Bolt Copper, ⅜ inch diameter and over, per pound..... 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier..... 28¢
12 ounce and up to 14 ounce to square foot..... 29¢
10 ounce and up to 12 ounce..... 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each. ..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 10¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 ..... Net

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch ₱ lb.....	50¢	⅜ inch ₱ lb.....	47¢
½ " "	44¢	½ " "	41¢
⅝ " "	42¢	⅝ " "	39¢
¾ " "	40¢	¾ " "	37¢
⅞ " "	39¢	⅞ " "	36¢
1 " "	37¢	1 " "	34¢
1½ " "	34¢	1½ " "	31¢

Roll and Sheet Brass.

Discount from list. ..... .10 @ 15 ₱ ct

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₱ 100 lb.

Western Spelter.	5½ @ 6¢
"Bergenport"	8½¢
"Bertha"	7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₱ lb.

600 lb casks.....	6½¢
Per lb	¢

Lead.

Duty: Pig, $2 ₱ 100 lb. Old Lead, 2¢ ₱ lb. Pipe and Sheets, 3¢ ₱ lb.

American.....	@ 4½¢
Newark	@ 4½¢
Bar	@ 5 ¢
Pipe.....	7¢, dis 20 ₱ ct
Tin-Lined Pipe	15¢, dis 20 ₱ ct
Block Tin Pipes.....	45¢, dis 20 ₱ ct
Sheet	7¾¢, dis 20 ₱ ct

Solder.

½ @ ½ (Guaranteed)... ..... 20¢
Extra Wiping ..... 17¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson... ..... ₱ lb 13¾ @ 14¢
Hallett's ..... " 11¾¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops.....	55&10&2
Ground Stops, Hydrant Cocks, &c.....	55&10&2
Corporation Cocks.....	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list.....	55&10&2
Ground Basin and Shampooing Cocks....	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks.....	50&10&2
Compression Pantry Cocks.....	50&10&2
Compression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks.....	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.....	50&10&2
Basin Plugs and Basin Grates.....	55&10&2
Bath and Wash Tray Plugs.....	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.	55&10&2
Basin Clamps, Basin Joints and Strainers.	55&10&2
Boiler Couplings, Ground Face, per set $1.25..	..dis 10
Boiler Couplings, Plain Face, per set.	$1.20...dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.....	55&10&2
Union Joints.....	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.....	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves...	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels.....	40&10&2
Brass Globe Valves, with Patent Wood Wheels.	60&10&2
Brass Globe Angle and Corner Valves.....	60&10&2
Brass Radiator Angle Valves.....	60&10&2
Brass Radiator Angle Valves. Frink's Patent.	60&10&2
Brass Cross and Check Valves.....	60&10&2
Brass Check Valves...	60&10&2
Brass Hose Valves.....	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves.....	60&10&2
Brass Vacuum Valves.....	50&10&2
Brass Whistle Valves.....	60&10&2
Brass Balance, Back Pressure and Foot Valves.	50&10&2
Brass Butterfly and Throttle Valves.....	50&10&2
Brass Pump Valves.....	50&10&2
Brass Steam Cocks....	57½&10&2
Brass Service, Meter and Union Meter Cocks.....	57½&10&2
Brass Whistles, Water Gauges and Oil Cups..	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups.	50&10&2
Brass Lubricators.....	60&10&2
Brass Air Valves.	60&10&2
Brass Air Cocks.....	60&10&2
Brass Gauge Cocks.....	55&10&2
Brass Cylinder Cocks and Steam Bibbs...	50&10&2
Brass Swing Joints and Expansion Joints.	50&10&2
Brass Test Pumps.	50&10&2
Brass Steam Fittings, Rough.....	60&10&2
Brass Steam Fittings, Finished..	30&10&2
Brass Union Joints.....	60&10&2
Brass Soldering Unions and Nipples....	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs.....	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.....	65&10&2
Iron Cocks, all Iron.....	65&10&2
All Iron Valves.....	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings.....	70&10
Plugs and Bushings	75&10
Malleable Iron Unions...	67½
Malleable Iron Fittings.....	60

Paints.

Black, Lamp—Coach Painters'.....	₱ lb 22 @ 24¢
" Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
" best.....	23¢
Black Paint, in oil.....kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best.....	40 @ 55¢
" " in oil.....	45 @ 55¢
" Chinese dry	70¢
" Ultramarine.....	18 @ 30¢
Brown, Spanish.....	1¼¢
" Van Dyke.....	10 @ 12¢
Dryers, Patent American..ass'd cans, 9¢; kegs,	7¢
Green, Chrome	15 @ 25¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil.....	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	₱ lb 2½¢
Iron Paint, Brown.....	₱ lb 1½¢
Iron Paint, Purple	₱ lb 3¢
Iron Paint, Ground in oil, Bright Red....	₱ lb 6½¢
Iron Paint, Ground in oil, Red	₱ lb 5½¢
Iron Paint, Ground in oil, Brown.....	₱ lb 5½¢
Iron Paint, Ground, Purple.....	₱ lb 6¢
Litharge.....	6½¢
Mineral Paints..	.2 @ 4¢
Orange Mineral	10¢
Red Lead, American.	6½¢
Red Venetian (Eng.) dry.....	$1.65 @ $1.70
Red Venetian in oil.....ass't cans, 11¢ ; kegs,	8¢
Red Indian Dry.	9 @ 12¢
Rose Pink.....	.10 @ 12¢